

Colorado

Water Supply Outlook Report

January 1st, 2022



Hydrologist Zack Wilson and Tristan Amaral prepare for a snow survey training on January 10th at Monarch Pass. Storms in December helped push the snowpack to above median levels in the area. Porphyry Creek SNOTEL, near the summit of Monarch Pass, recorded 139 percent of median snow water equivalent (SWE) on January 1st.

Photo By: Heather McIntyre

REMINDER: We are soliciting field work photos from the field again this year. Each month we will pick one to grace the cover of this report! Please include information on where, when and of who/what the photo was taken.

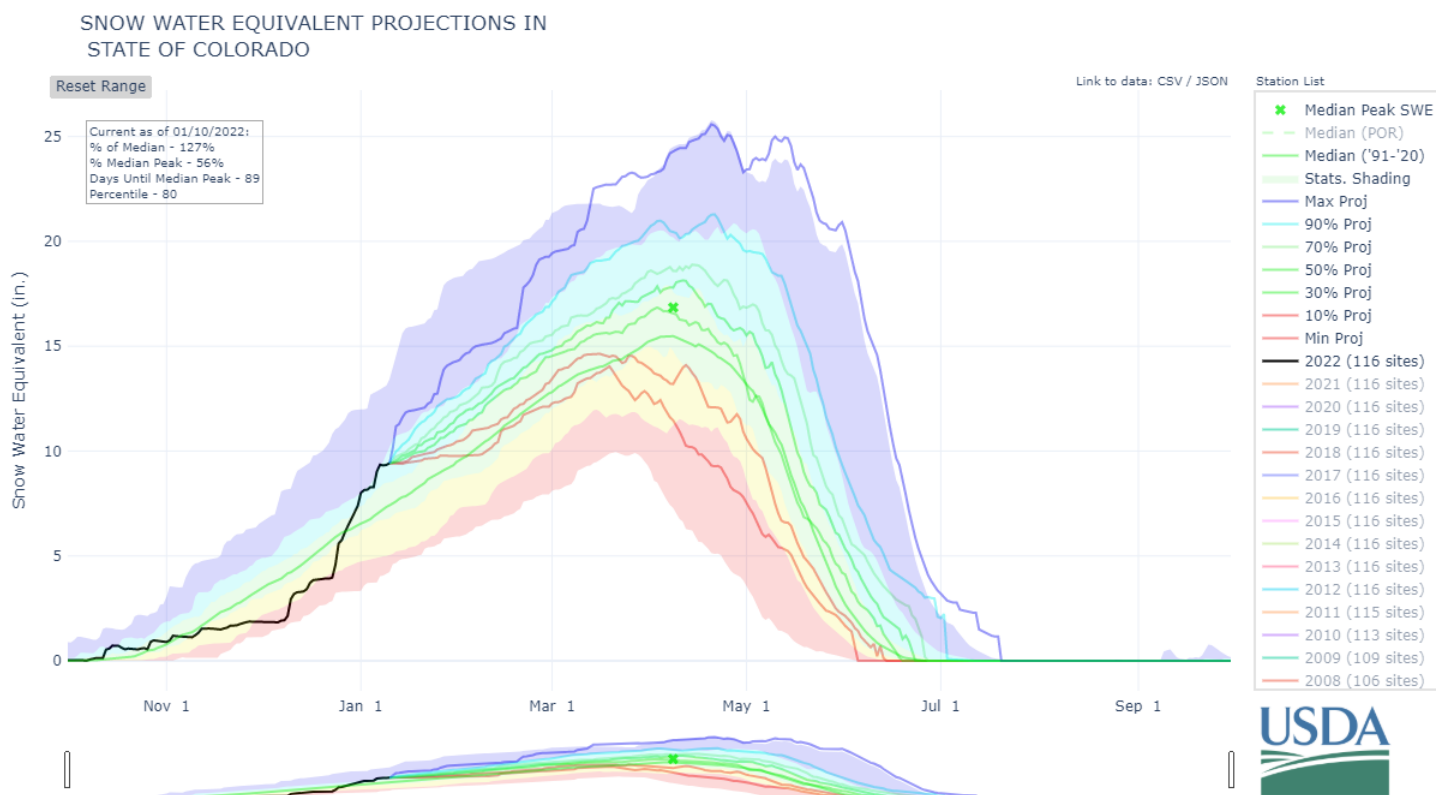
Contents

Colorado Statewide Water Supply Conditions.....	3
Summary	3
Snowpack	4
Precipitation.....	5
Reservoir Storage	6
Streamflow.....	7
GUNNISON RIVER BASIN	8
COLORADO HEADWATERS RIVER BASIN	12
SOUTH PLATTE RIVER BASIN	16
YAMPA-WHITE-LITTLE SNAKE AND LARAMIE-NORTH PLATTE RIVER BASINS	20
ARKANSAS RIVER BASIN	25
UPPER RIO GRANDE RIVER BASIN	29
SAN MIGUEL-DOLORES-ANIMAS-SAN JUAN COMBINED RIVER BASIN.....	33
How to Read Snowpack Graphs	37
How Forecasts Are Made	38
Interpreting the Forecast Graphics	39

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Colorado Statewide Water Supply Conditions

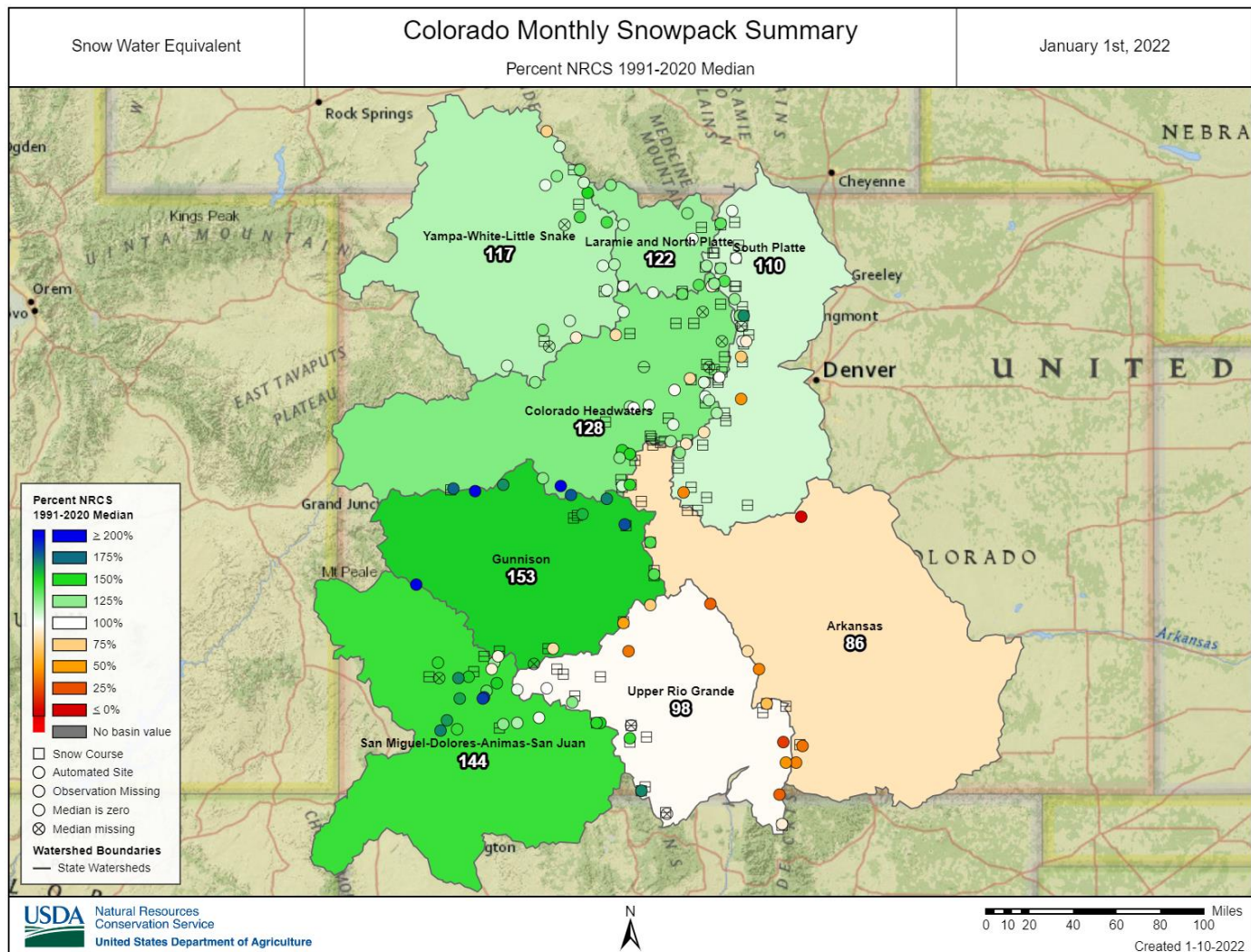
Summary



[Drought conditions](#) across most of the state have persisted through much of the 2022 water year. The state experienced warm temperatures and received close to median precipitation through most of October. November to early December was particularly dry with drought conditions dominating the latter half of November and early December. However, toward the end of December, all major river basins across the State received generous snowfall. These recent storms brought statewide values up above median for both precipitation and snowpack, which delivered record December snowpack to many SNOTEL sites located in the Elk and the San Juan Mountains. As of January 1st, water year-to-date precipitation for Colorado is 120 percent of median. Current statewide snowpack is 126 percent of median, with a high in the Gunnison River basin at 153 percent of median, and a low in the Arkansas River basin at 86 percent of median. Streamflow forecasts across the state follow similar spatial trends as precipitation and snowpack, with forecasts currently highest in the Gunnison and the lowest in the Arkansas and South Platte River basins at 130 percent and 101 percent of median, respectively. Reservoir levels across the state have remained largely below median due to the widespread drought conditions that the state has experienced since last summer. Current statewide reservoir storage is 82 percent of normal.

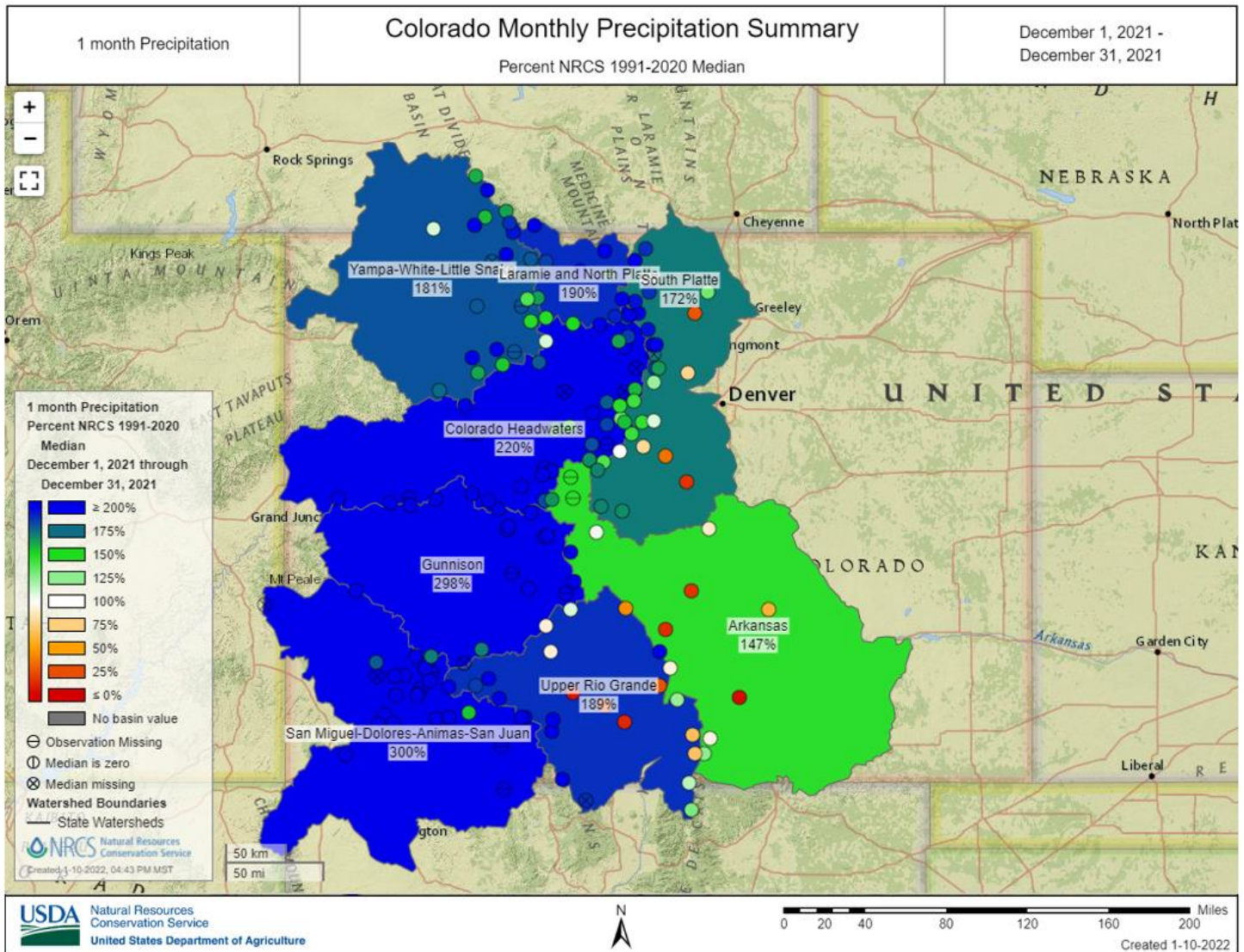
The NRCS Snow Survey and Water Supply Forecasting (SSWSF) Program recently published new statistical normals (median or average) to describe the central tendency of a data record over a 30-year period. Data normals are key in helping water users compare current conditions to past conditions using the metric “% of normal.” Every 10 years, the SSWSF Program updates the 30-year normals reference period to stay consistent with World Meteorological Organization standards that account for changing climatic conditions over time. As such, this year the SSWSF Program transitioned from using 1981-2010 data normals to using 1991-2020 data normals. By default, all data products will use the median of the 1991-2020 datasets. Although the differences between 1981-2010 normals and 1991-2020 normals are generally small for most data variables, differences do exist. More detailed information on the updated normals can be found on the Water and Climate Center’s [30-year normals page](#).

Snowpack



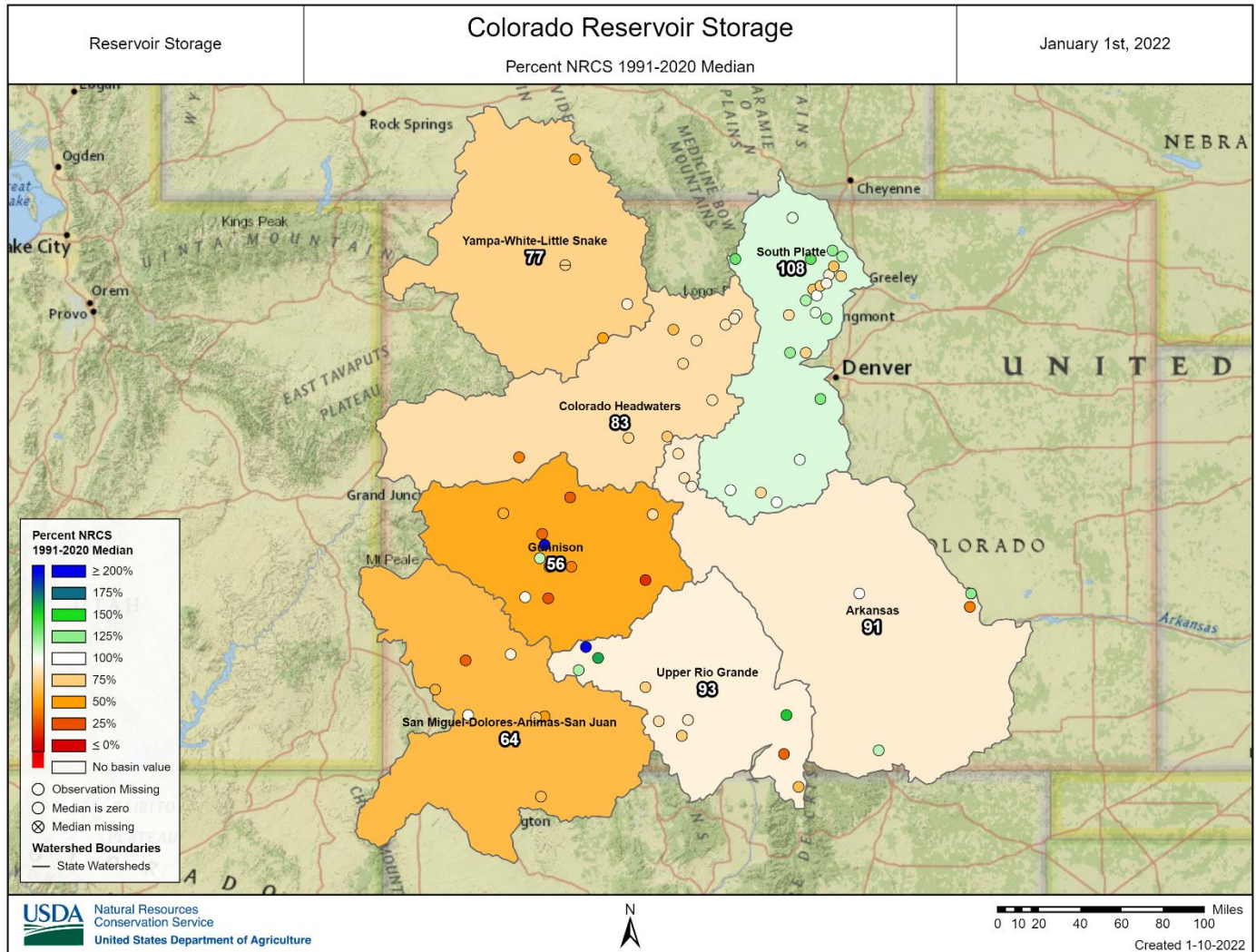
Recent storms across much of Colorado have provided generous snowfall. In early December, we were below median SWE in all major river basins across the State. Now, we are above median across the State, sitting at 126 percent. At basin-scale, we are currently above median in all but the Arkansas and Upper Rio Grande River basins, which are at 86 and 98 percent, respectively. The combined San Miguel-Dolores-Animas-San Juan and Gunnison River basins are leading the way with 144 percent and 153 percent, respectively, while the Colorado, combined Yampa-White-Little Snake and Laramie-North Platte are all around 120 percent of median. The South Platte is not too far behind at 110 percent of median. These more recent snowfall events occurring across the state deposited upwards of 19" of snow water equivalent. Not a bad way to start off the New Year!

Precipitation



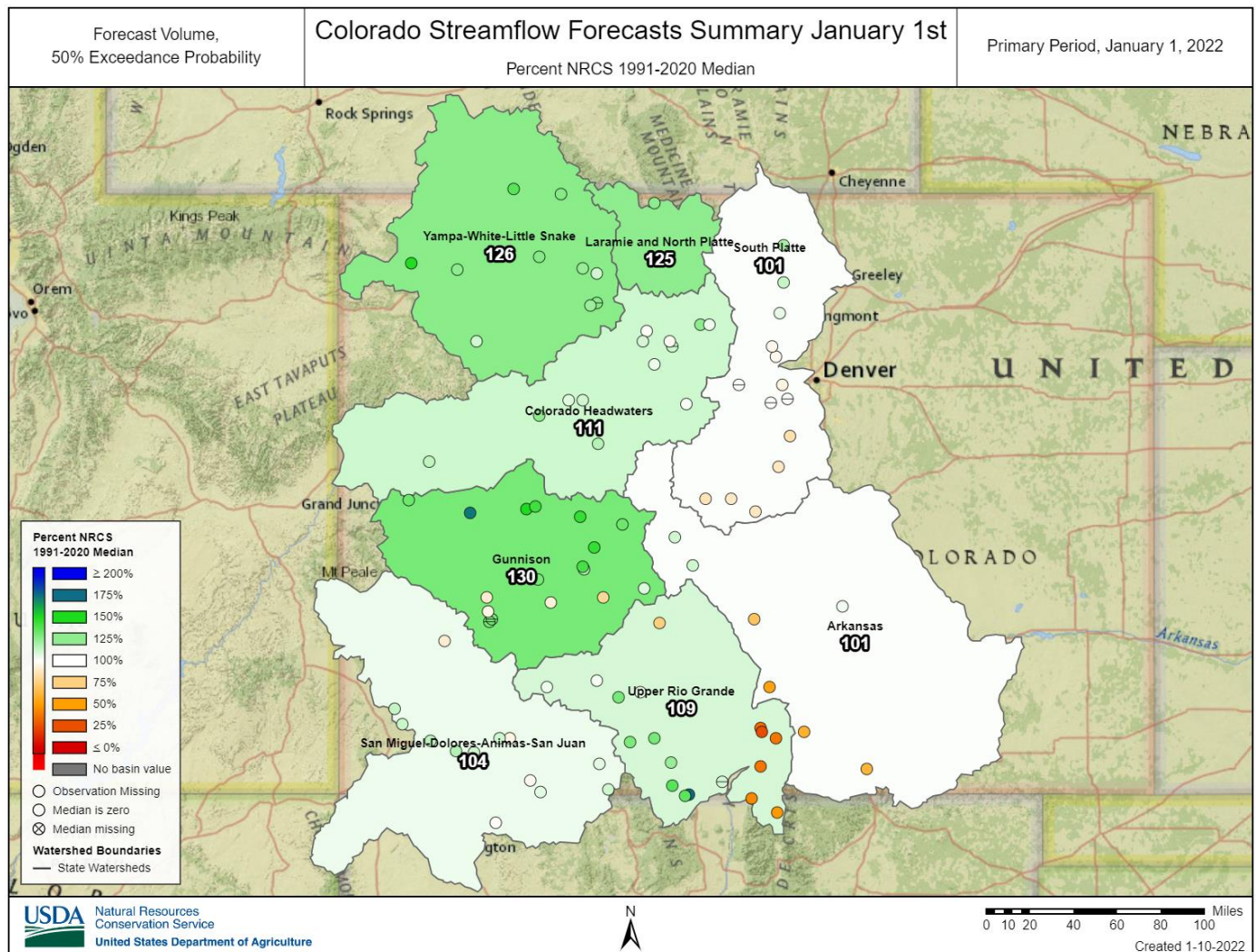
The 2022 water year got off to a slow start in terms of precipitation, but recent storms have helped tremendously. Statewide, Colorado received 217 percent of median for December and 120 percent of median for the 2022 water-year. At basin-scale, we are currently above median across the state as well. The combined San Miguel-Dolores-Animas-San Juan and Gunnison River basins are leading the way with around 300 percent of median right now and the Colorado River basin is at 220 percent. The Upper Rio Grande and Laramie-North Platte are both around 190 percent of median, followed by the combined Yampa-White-Little Snake and South Platte at 181 and 172 percent of median, respectively. The Arkansas River also received above normal precipitation at 147 percent of median. Despite precipitation gains in November and December much of the state remains in a drought ([map](#)). The [Climate Prediction Center](#) predicts that La Nina conditions are favored to continue throughout the 2021-2022 winter season and the most recent precipitation probability outlook shows near-to-above-normal precipitation across Colorado over the next two weeks.

Reservoir Storage



Statewide reservoir storage was 74 percent of normal to end the month of December. During the last three months, in most major river basin reservoir storage remained below median. This trend continued in December with only the South Platte River basin ending the month with above median storage at 108 percent. The Colorado River basin reservoir storage is at 83 percent of median. The Upper Rio Grande River basin has 93 percent of median storage. Reservoir storage in the Gunnison River basin and combined San Miguel-Dolores-Animas-San Juan River basin remained below median at 56 and 64 percent of median, respectively, this is largely due to continued below average snowfall in the region last winter. The Arkansas River basin remained at 91 percent of median storage at the end of December and the combined Yampa-White-Little Snake River basin had 77 percent of median storage. Overall, most River basins show below median reservoir storage, and many below the storage amounts last December. Continuance of recent precipitation and snowfall amounts may improve these numbers as the year progresses.

Streamflow

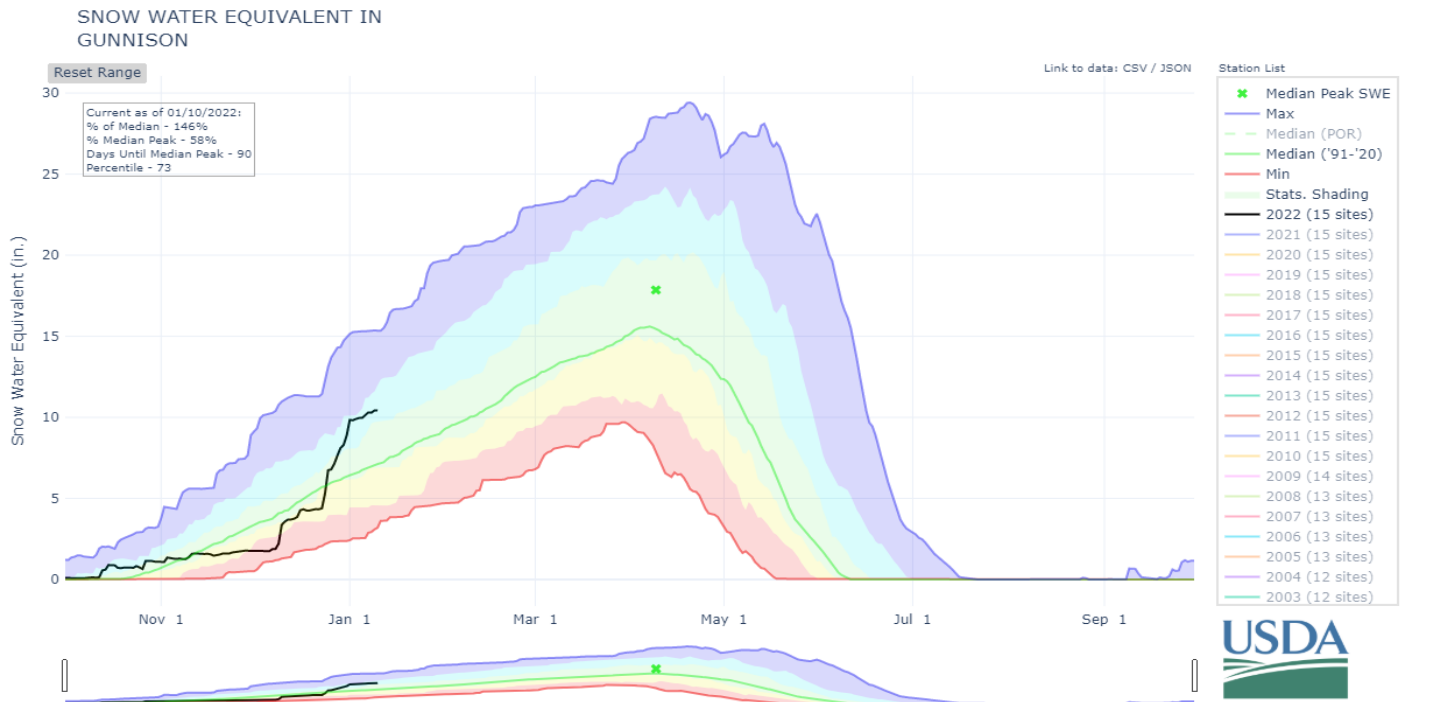


After an early winter season of below average snowpack and precipitation, gains in snowpack over the past few weeks has resulted in a promising outlook for the upcoming runoff season. Statewide, streamflow forecasts are 115 percent of median with all major basins having above to well above normal streamflow forecasts. The forecasts for all basins currently range from 104 percent in the combined San Miguel-Dolores-Animas-San Juan River basins to 130 percent in the Gunnison River basin. Aided by abundant snowfall on the western slope, streamflow forecasts for western river basins are all considerably higher than they were last year at this time. The combined Yampa-White-Little Snake and combined Laramie-North Platte River basin are 126 percent and 125 percent, respectively. Moving south along the western slope, the Colorado Headwaters and Gunnison River basins are 111 percent and 130 percent, respectively. The Upper Rio Grande River basin, at 109 percent of median, shows strong variability from the much drier eastern side of the San Luis Valley as compared to the western side of the basin. The eastern Cumbres-Trinchera sub-basin is currently at 34 percent of median while the western Conejos and Rio San Antonio sub-basins are both at 136 percent of median. The streamflow forecast outlooks for Colorado's eastern basins are slightly less optimistic with the South Platte and Arkansas both at 101 percent of median. Despite an encouraging start to this winter, with La Nina conditions likely to persist in the Pacific Ocean, forecasts will likely evolve over the course of the winter and spring.

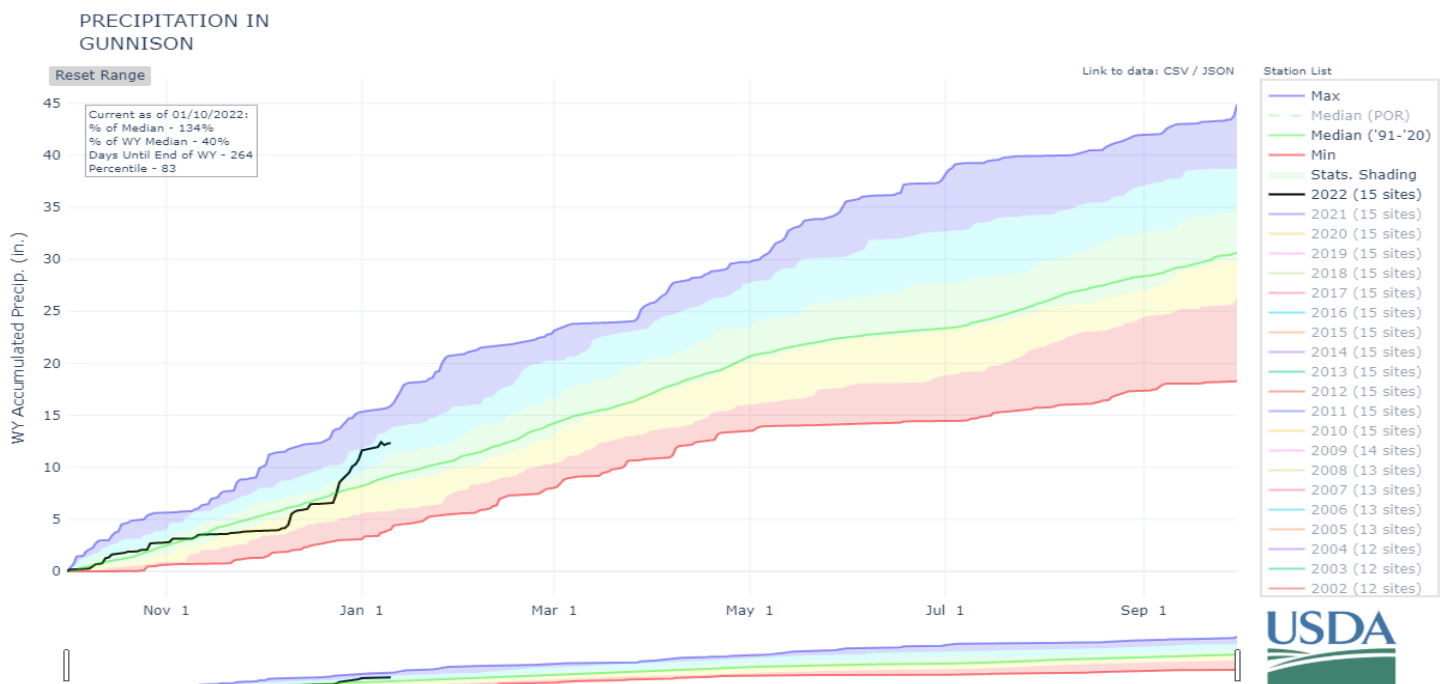
GUNNISON RIVER BASIN

January 1st, 2022

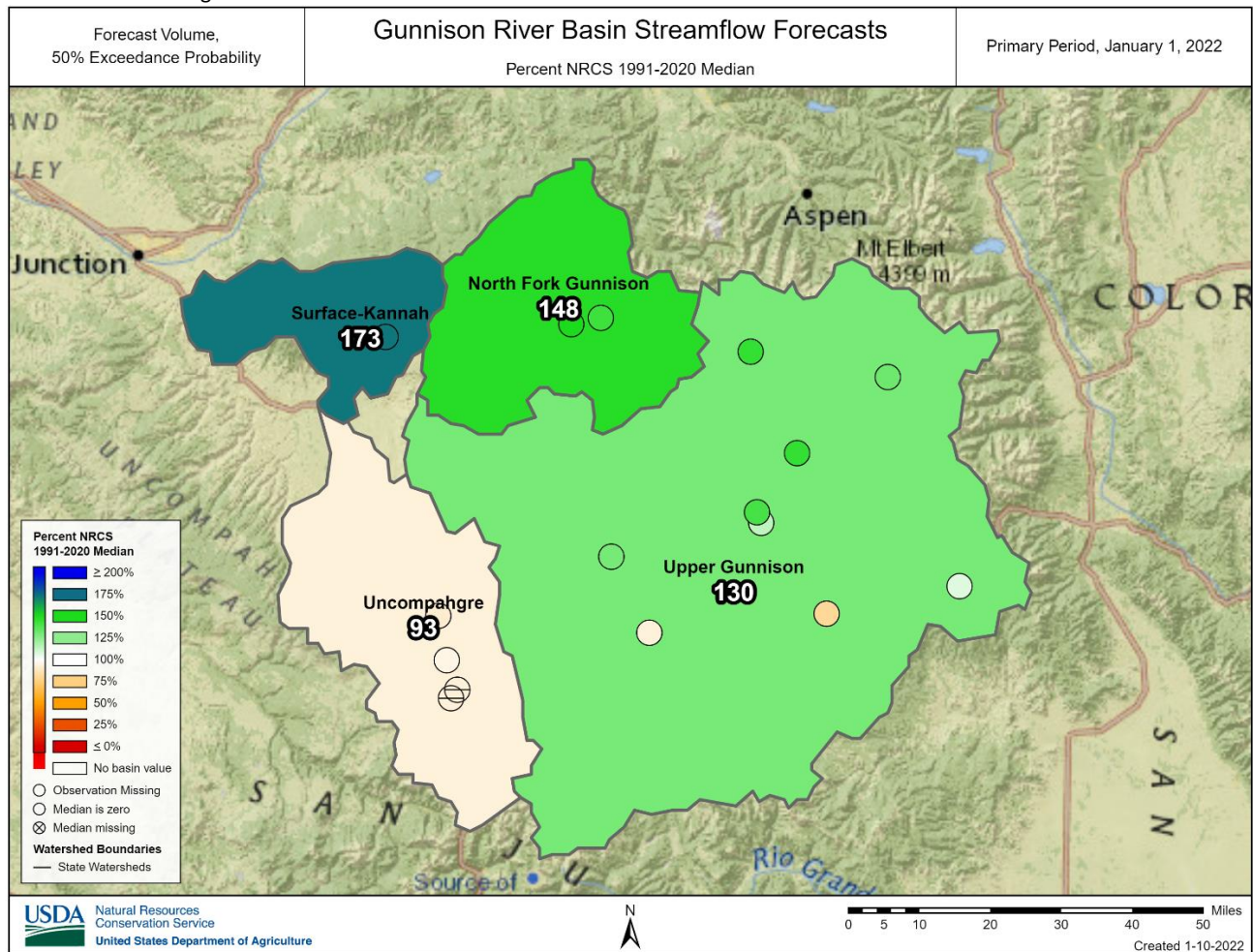
Snowpack in the Gunnison River basin is above normal at 153% of the median. Precipitation for December was 298% of median which brings water year-to-date precipitation to 142% of median. Reservoir storage at the end of December was 56% of median compared to 75% last year. Current April – July streamflow forecasts range from 80% of median at Cochetopa Creek below Rock Creek near Parlin to 173% of median at Surface Creek at Cedaredge.



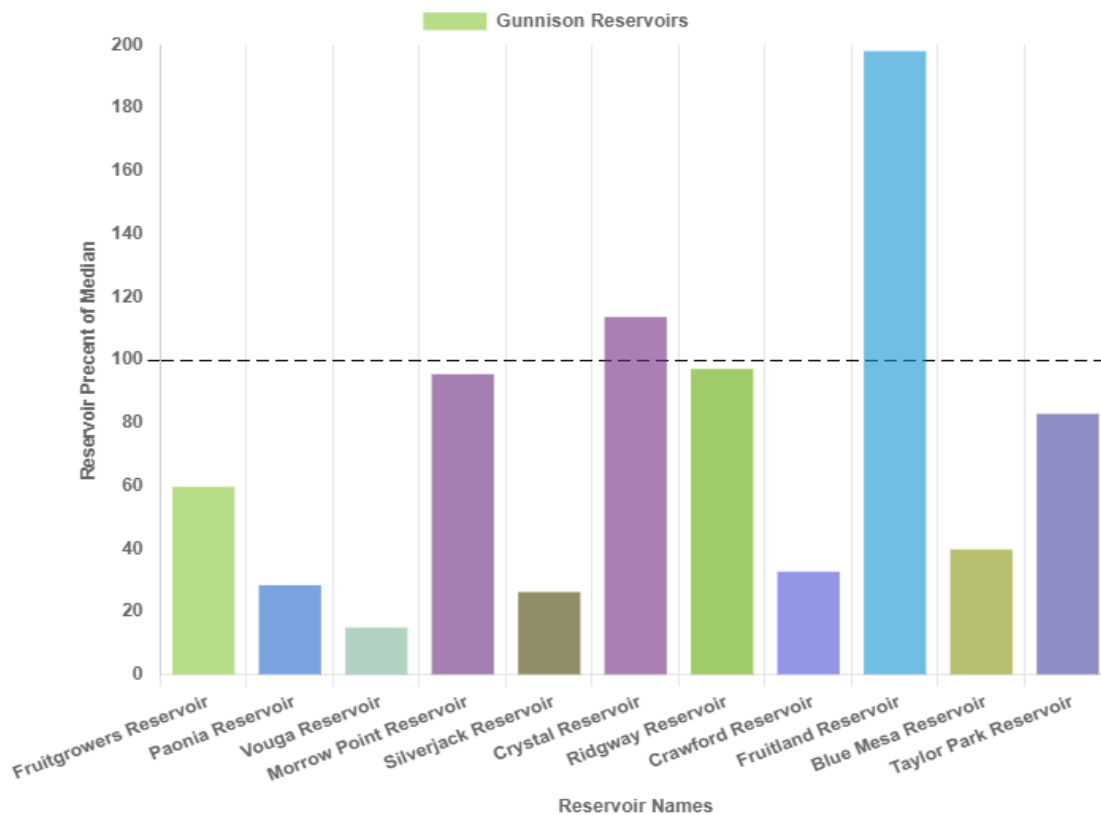
*SWE values calculated using daily SNOTEL data only



*SWE values calculated using first of month SNOTEL data and snow course measurement



Reservoir Conditions for Gunnison on January 1st 2022



Watershed Snowpack Analysis January 1st, 2022

Sub-Basin	# of Sites	% Median	Last Year %
			Median
Upper Gunnison	10	157	76
Surface Creek	2	194	62
Uncompahgre	3	143	81
Basin-Wide Total	13	153	77

*SWE values calculated using first of month SNOTEL data and snow course measurements

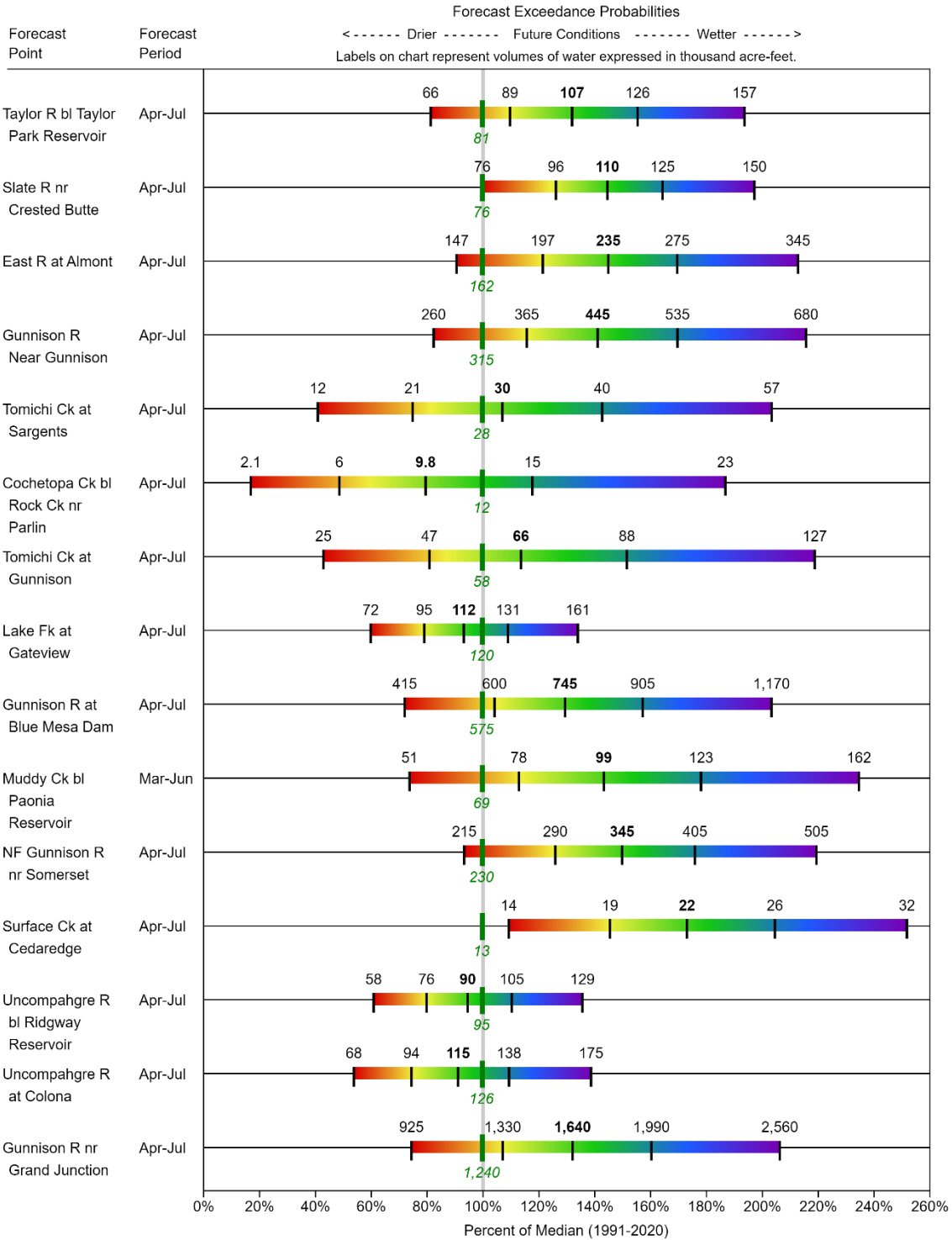
Reservoir Storage End of December 2021

Reservoir	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
BLUE MESA RESERVOIR	396.8	587.5	549.9	830.0
CRAWFORD RESERVOIR	1.6	6.2	7.1	14.0
CRYSTAL RESERVOIR	8.8	7.4	7.7	17.5
FRUITGROWERS RESERVOIR	0.5	2.0	2.8	3.6
FRUITLAND RESERVOIR	0.2	1.0	1.0	9.2
MORROW POINT RESERVOIR	107.8	108.4	111.6	121.0
PAONIA RESERVOIR	1.2	2.3	3.5	15.4
RIDGWAY RESERVOIR	52.9	64.5	68.8	83.0
SILVERJACK RESERVOIR	0.2	0.8	5.0	12.8
TAYLOR PARK RESERVOIR	66.3	75.4	68.1	106.0
VOUGA RESERVOIR	0.2		0.7	0.9
BASINWIDE	636.5	855.4	826.2	1213.4
Number of Reservoirs	11	10	11	11

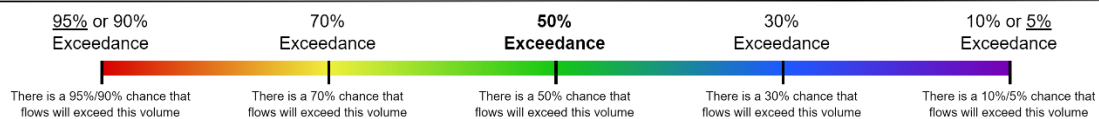
GUNNISON RIVER BASIN

Water Supply Forecasts

January 1, 2022



Legend



When selected, the following historic streamflow values and statistics will be shown.

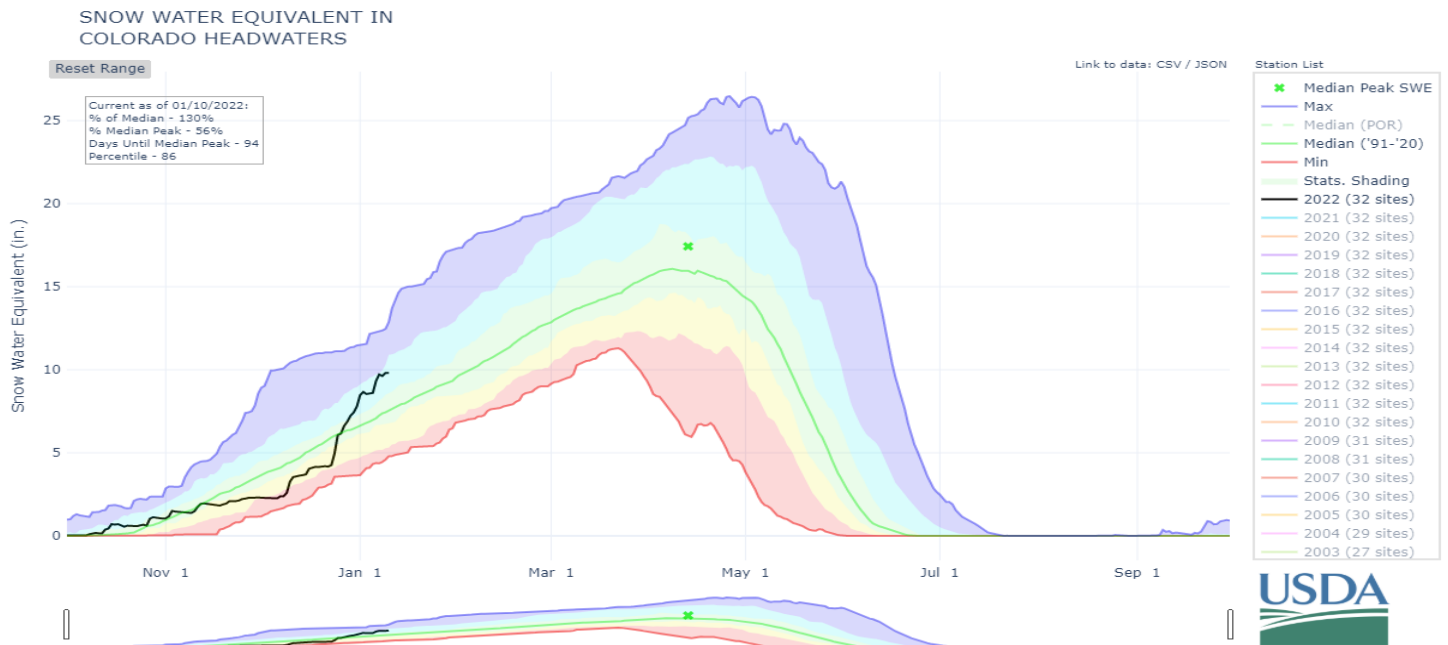
Period of Record Minimum Streamflow KAF (Year) 1991-2020 Normal Streamflow KAF Observed Streamflow KAF Period of Record Maximum Streamflow KAF (Year)

Some forecasts may be for volumes that are regulated or influenced by diversions and water management.

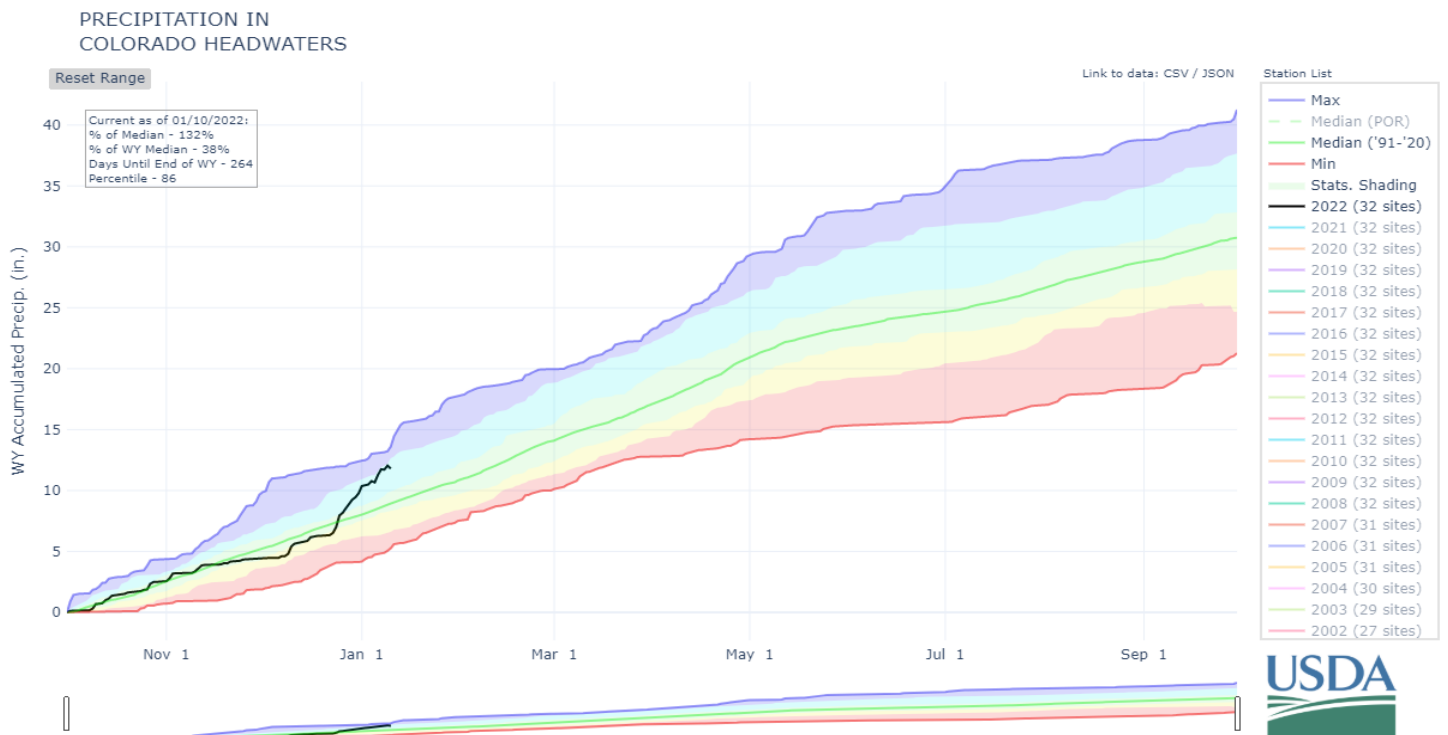
COLORADO HEADWATERS RIVER BASIN

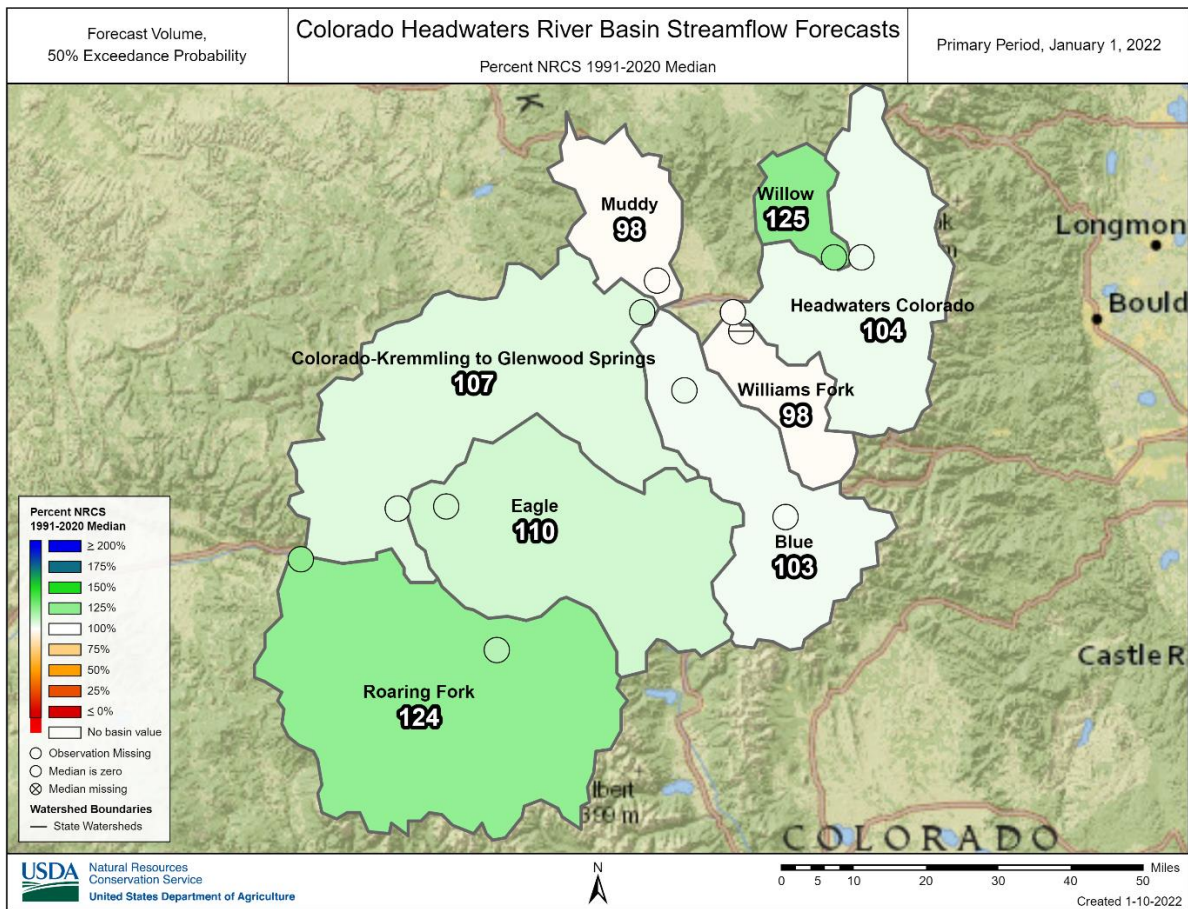
January 1st, 2022

Snowpack in the Colorado River basin is above normal at 128% of the median. Precipitation for December was 220% of median which brings water year-to-date precipitation to 129% of median. Reservoir storage at the end of December was 83% of median compared to 100% last year. Current streamflow forecasts range from 98% of median at Williams Fork below Williams Fork Reservoir to 125% of median at Roaring Fork at Glenwood Springs.

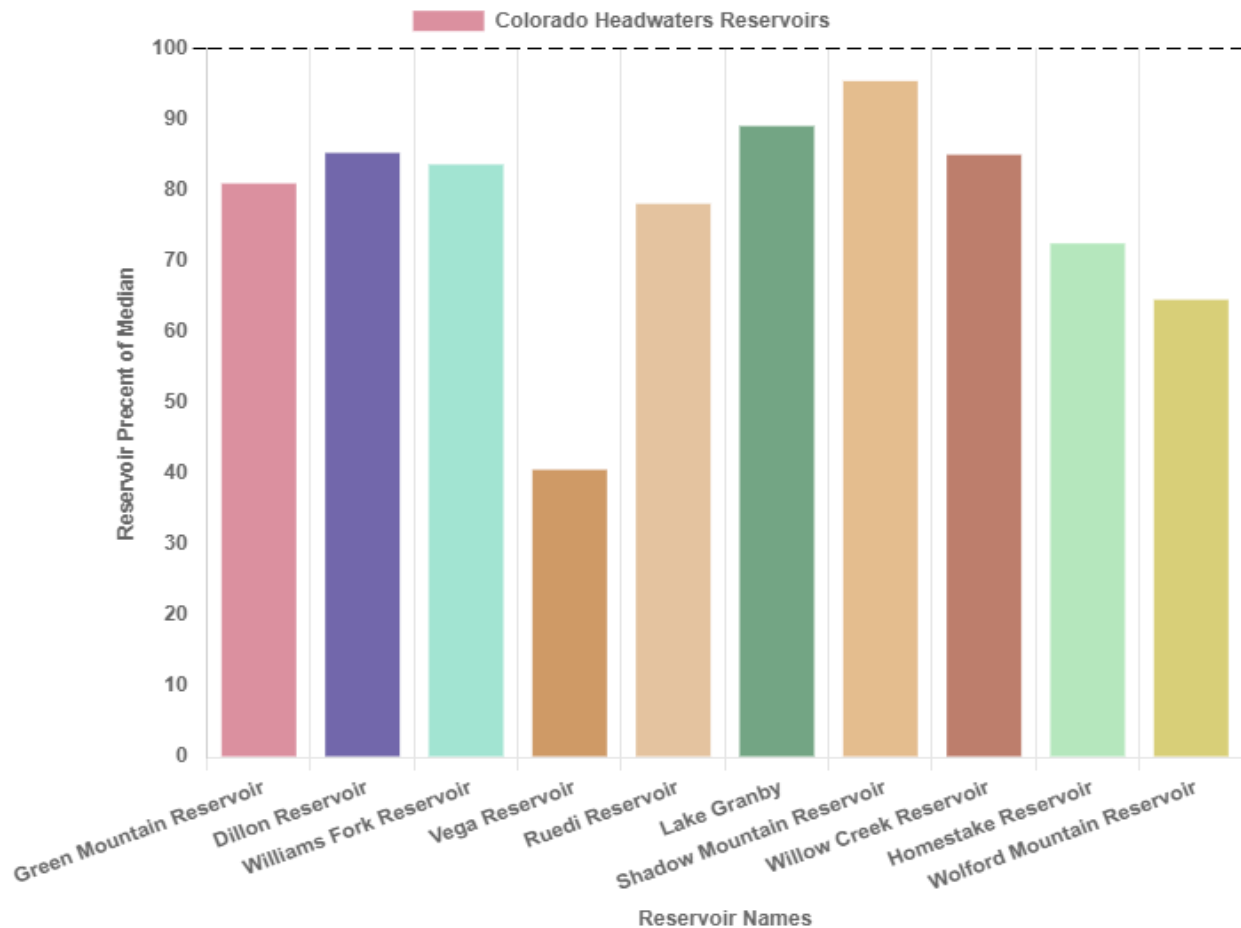


*SWE values calculated using daily SNOTEL data only





Reservoir Conditions for Colorado Headwaters on January 1st 2022



Watershed Snowpack Analysis January 1st, 2022

Sub-Basin	# of Sites	% Median	Last Year %
			Median
Blue River	5	108	81
Upper Colorado	19	106	78
Muddy Creek	3	108	78
Eagle River	4	103	69
Plateau Creek	5	147	66
Roaring Fork	7	159	81
Williams Fork	3	94	93
Willow Creek	2	131	68
Basin-Wide Total	28	121	78

*SWE values calculated using first of month SNOTEL data and snow course measurements

Reservoir Storage End of December 2021

Reservoir	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
DILLON RESERVOIR	212.8	222.0	222.1	249.1
LAKE GRANBY	366.6	381.3	325.7	465.6
GREEN MOUNTAIN RESERVOIR	67.2	67.4	85.2	146.8
HOMESTAKE RESERVOIR	40.3	41.2	31.9	43.0
RUEDI RESERVOIR	62.2	75.6	76.8	102.0
VEGA RESERVOIR	4.1	13.8	11.8	32.9
WILLIAMS FORK RESERVOIR	72.2	77.6	66.5	97.0
WILLOW CREEK RESERVOIR	5.8	6.6	6.6	9.1
WOLFORD MOUNTAIN RESERVOIR	54.4	51.3	44.0	65.9
SHADOW MOUNTAIN RESERVOIR	17.3	17.4	17.3	18.4
BASINWIDE	902.9	954.2	887.9	1229.8
Number of Reservoirs	10	10	10	10

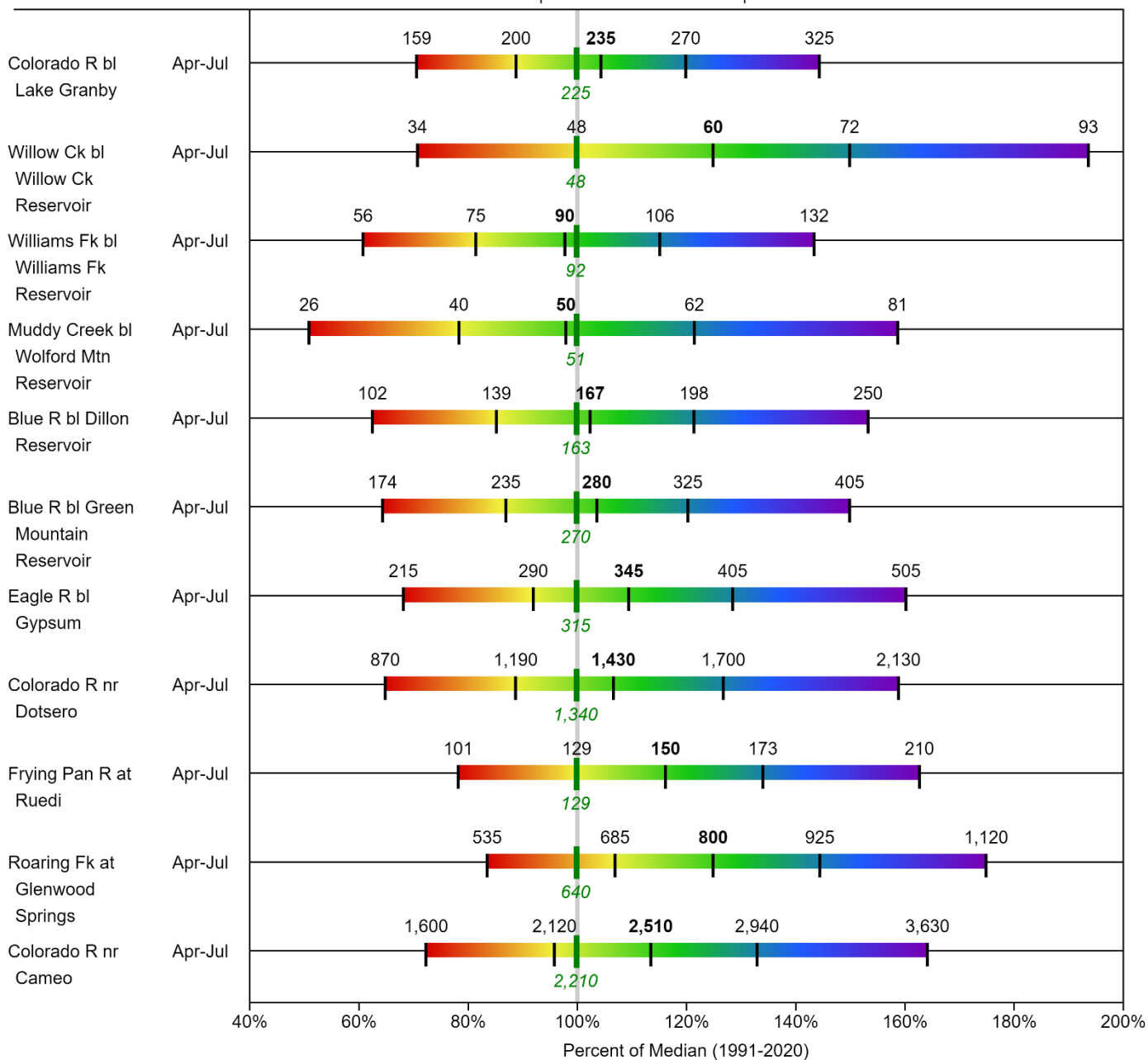
UPPER COLORADO RIVER BASIN

Water Supply Forecasts

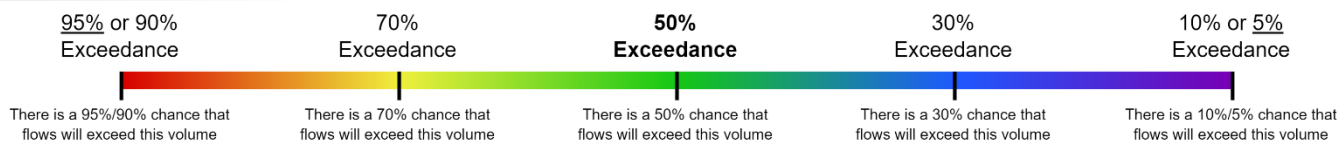
January 1, 2022

Forecast Exceedance Probabilities

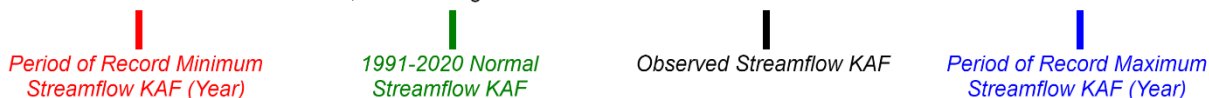
<----- Drier ----- Future Conditions ----- Wetter ----->
Labels on chart represent volumes of water expressed in thousand acre-feet.



Legend



When selected, the following historic streamflow values and statistics will be shown.

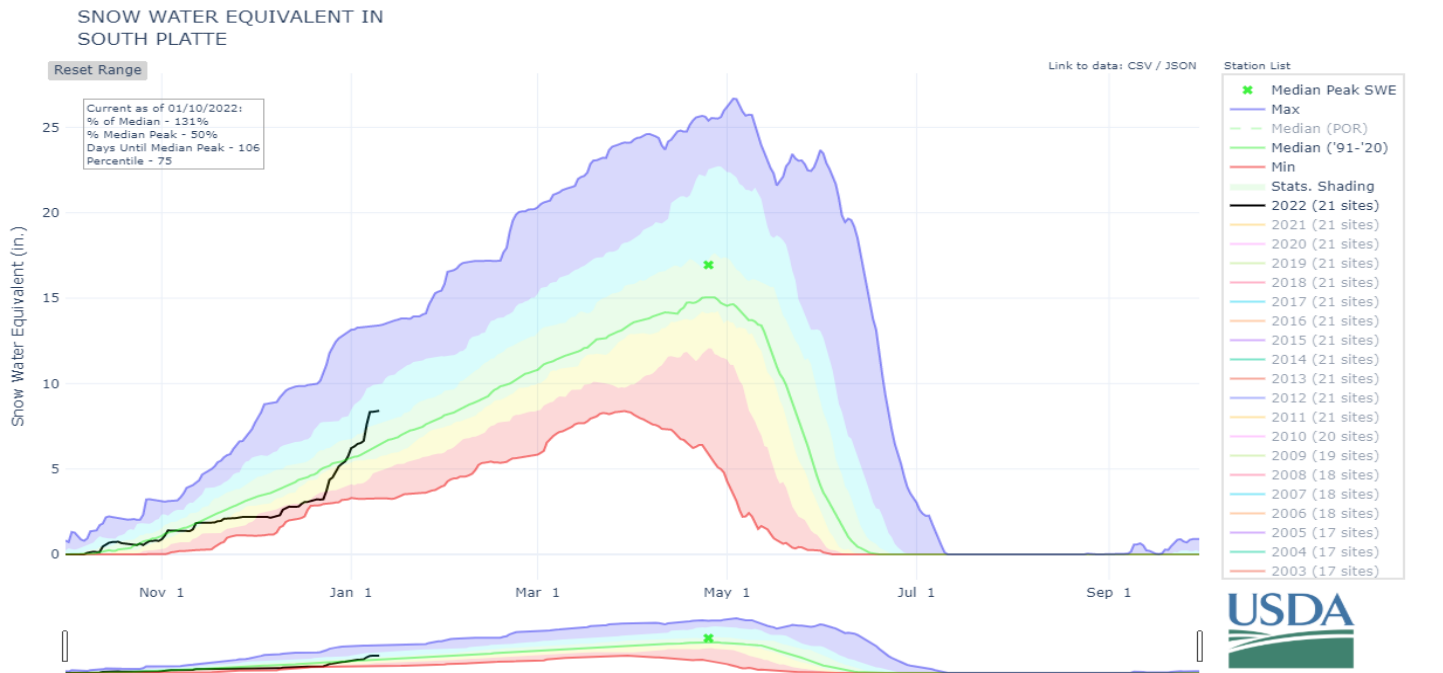


Some forecasts may be for volumes that are regulated or influenced by diversions and water management.

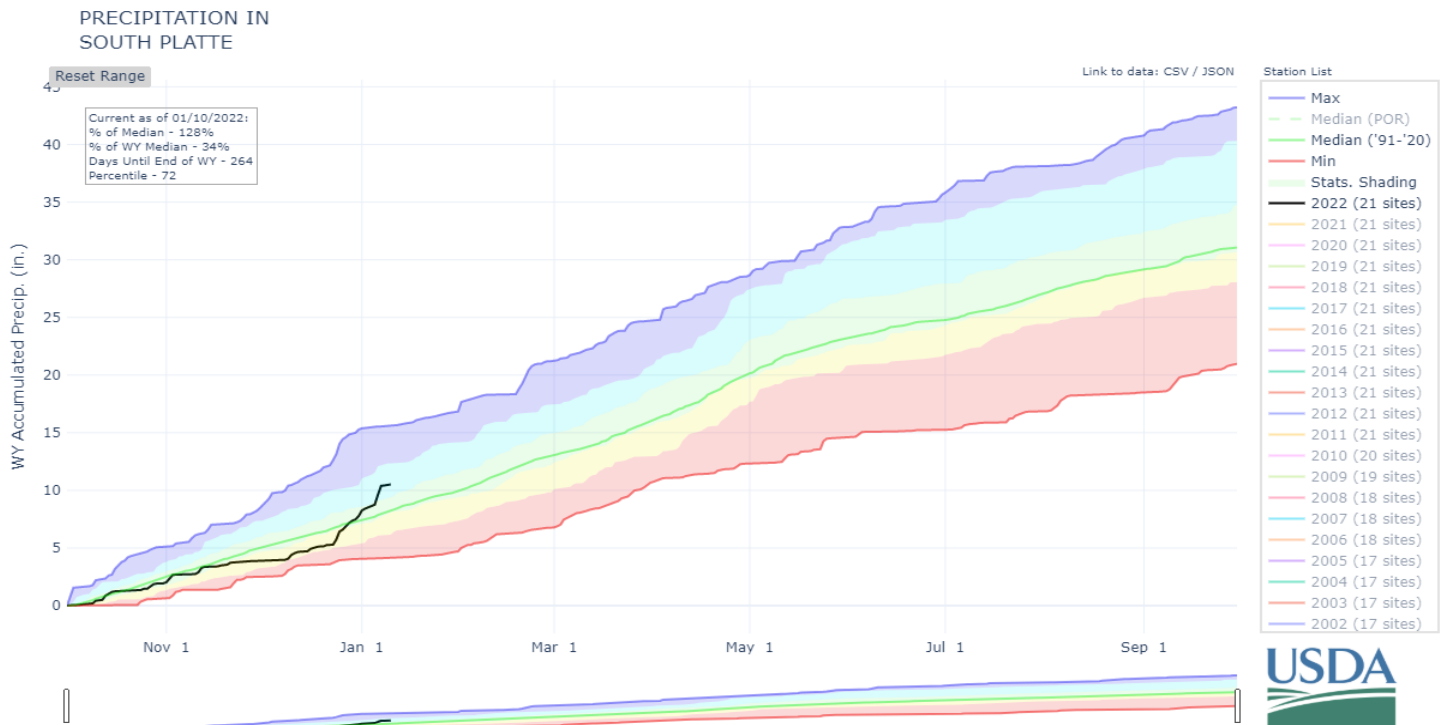
SOUTH PLATTE RIVER BASIN

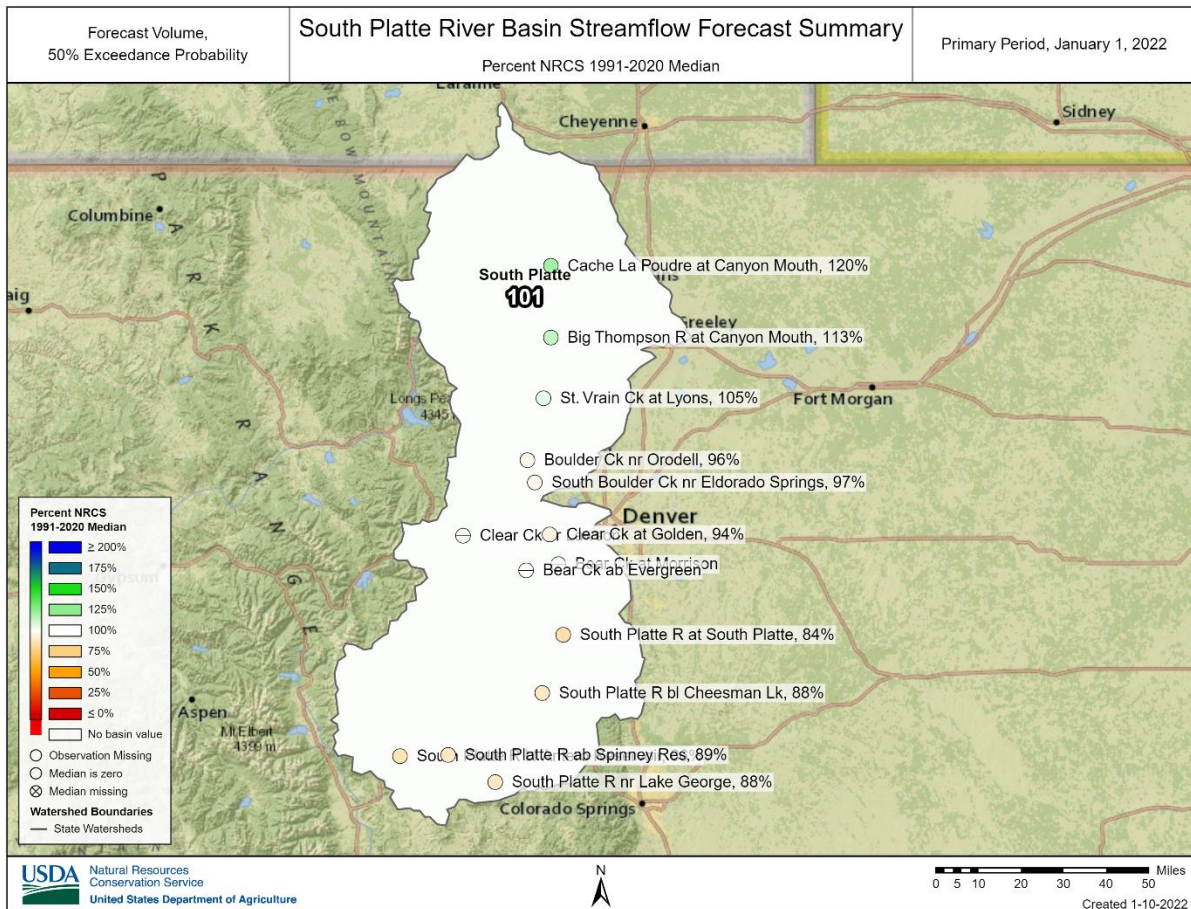
January 1st, 2022

Snowpack in the South Platte River basin is above normal at 110% of the median. Precipitation for December was 172% of median which brings water year-to-date precipitation to 111% of median. Reservoir storage at the end of December was 108% of median compared to 86% last year. Current streamflow forecasts range from 84% of median at South Platte River at South Platte to 120% of median at Cache La Poudre at Canyon Mouth.

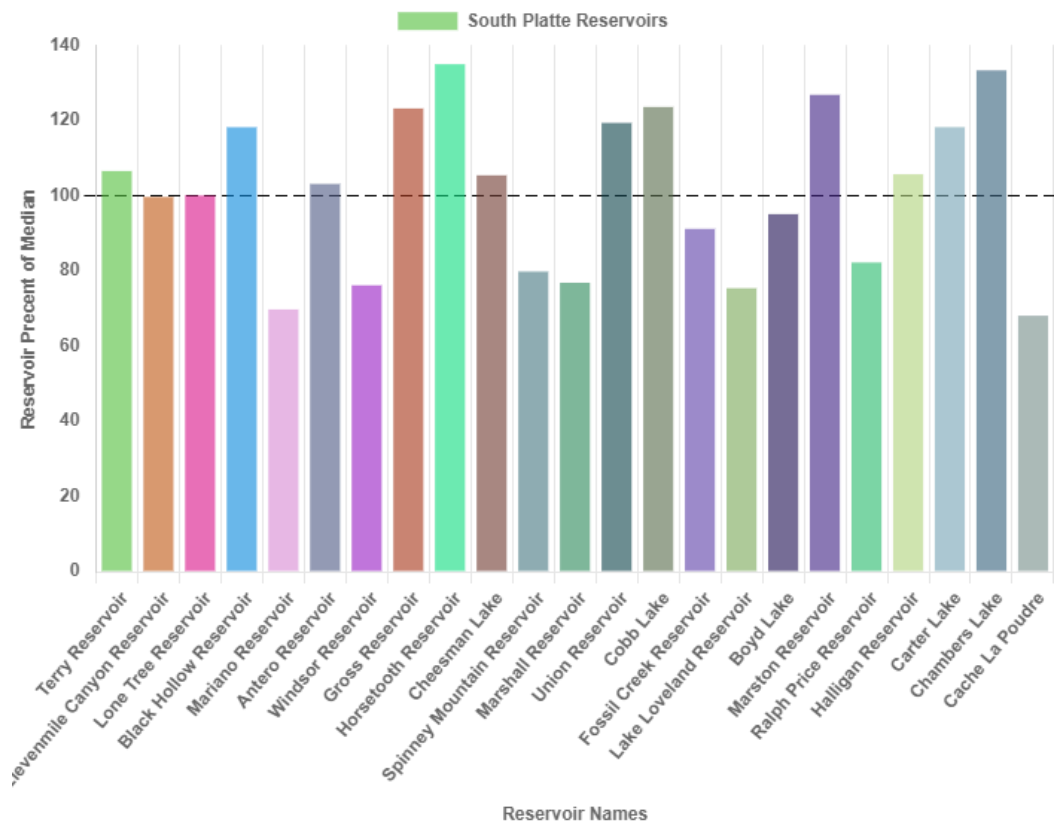


*SWE values calculated using daily SNOTEL data only





Reservoir Conditions for South Platte on January 1st 2022



Watershed Snowpack Analysis January 1st, 2022

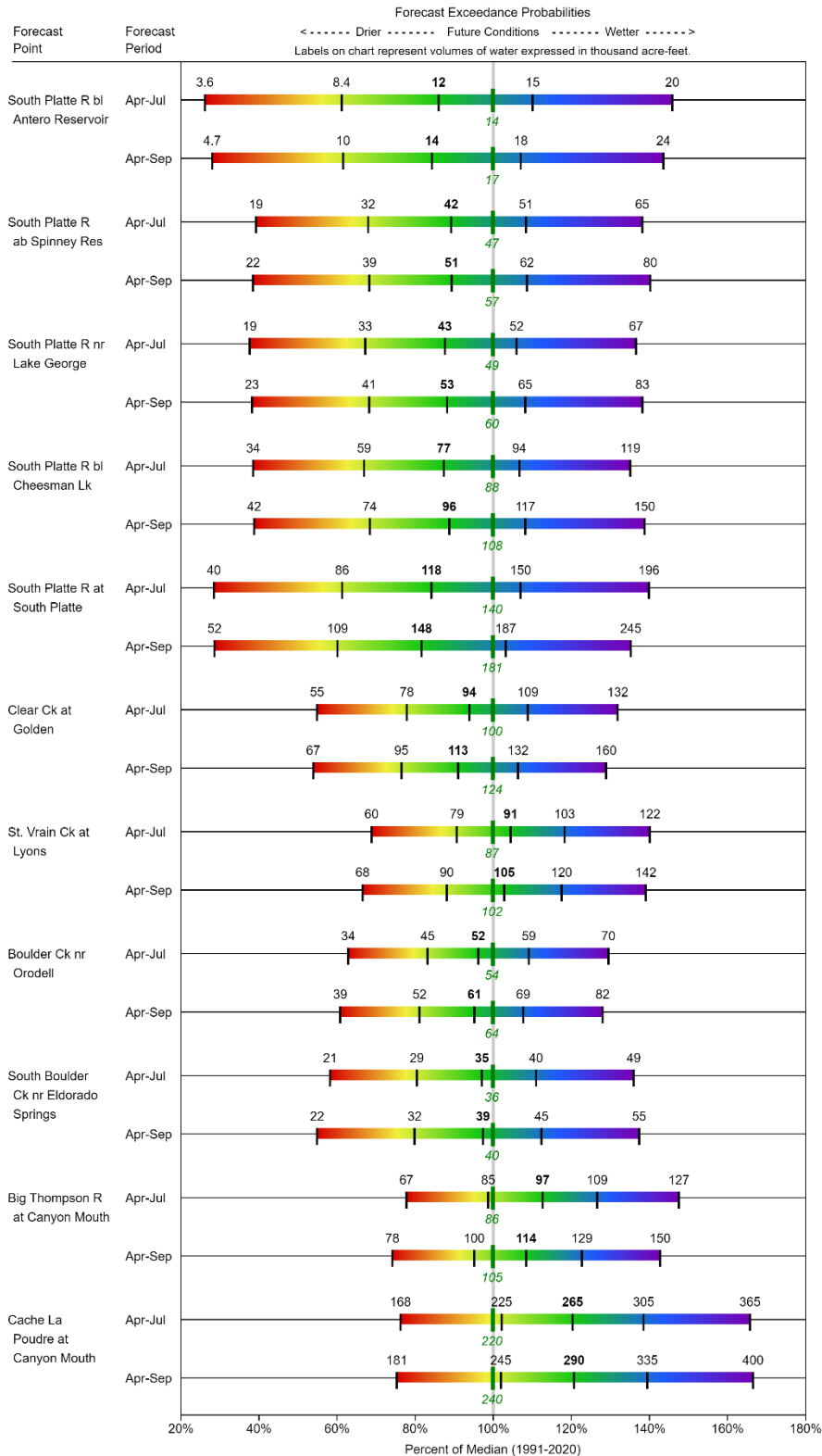
Sub-Basin	# of Sites	Last Year %	
		% Median	Median
Big Thompson	3	127	69
Boulder Creek	3	89	67
Cache La Poudre	2	123	83
Clear Creek	2	101	91
Saint Vrain	1	200	95
Upper South Platte	6	95	97
Basin-Wide Total	17	110	82

*SWE values calculated using first of month SNOTEL data and snow course measurements

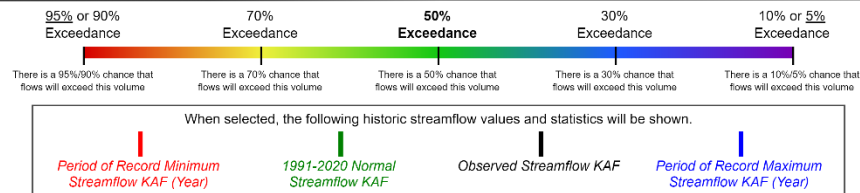
Reservoir Storage End of December 2021

Reservoir	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
ANTERO RESERVOIR	19.5	20.1	15.5	19.9
BARR LAKE	9.7	21.2	22.3	30.1
BLACK HOLLOW RESERVOIR	2.9	3.8	2.8	6.5
BOYD LAKE	29.3	34.3	27.4	48.4
CACHE LA POUDE	3.0	6.3	5.4	10.1
CARTER LAKE	75.5	68.5	67.5	108.9
CHAMBERS LAKE	5.7	4.7	3.1	8.8
CHEESMAN LAKE	36.8	60.7	64.3	79.0
COBB LAKE	15.5	18.2	11.7	22.3
ELEVENMILE CANYON RESERVOIR	96.3	99.5	95.9	98.0
EMPIRE RESERVOIR	22.7	18.2	20.6	36.5
FOSSIL CREEK RESERVOIR	5.9	9.3	6.3	11.1
GROSS RESERVOIR	11.0	22.8	15.4	29.8
HALLIGAN RESERVOIR	3.0	4.4	3.9	6.4
HORSECREEK RESERVOIR	0.0	0.0	8.5	14.7
HORSETOOTH RESERVOIR	72.0	133.1	83.5	149.7
JACKSON LAKE RESERVOIR	24.0	23.1	20.9	26.1
JULESBURG RESERVOIR	14.8	17.1	17.0	20.5
LAKE LOVELAND RESERVOIR	2.4	2.8	6.8	10.3
LONE TREE RESERVOIR	1.9	5.5	5.7	8.7
MARIANO RESERVOIR	2.1	0.2	2.9	5.4
MARSHALL RESERVOIR	4.8	5.4	5.4	10.0
MARSTON RESERVOIR	9.9	9.4	6.0	13.0
MILTON RESERVOIR	2.5	18.2	14.3	23.5
POINT OF ROCKS RESERVOIR	32.1	61.9	43.3	70.6
PREWITT RESERVOIR	11.5	20.8	13.9	28.2
RIVERSIDE RESERVOIR	31.9	44.2	32.1	55.8
SPINNEY MOUNTAIN RESERVOIR	23.6	38.6	30.5	49.0
STANDLEY RESERVOIR	31.0	39.2	35.8	42.0
TERRY RESERVOIR	5.5	5.2	5.1	8.0
UNION RESERVOIR	7.9	8.5	9.8	13.0
WINDSOR RESERVOIR	6.0	10.1	7.7	15.2
BASINWIDE	620.7	835.3	711.3	1079.5
Number of Reservoirs	32	32	32	32

SOUTH PLATTE RIVER BASIN
Water Supply Forecasts
 January 1, 2022



Legend



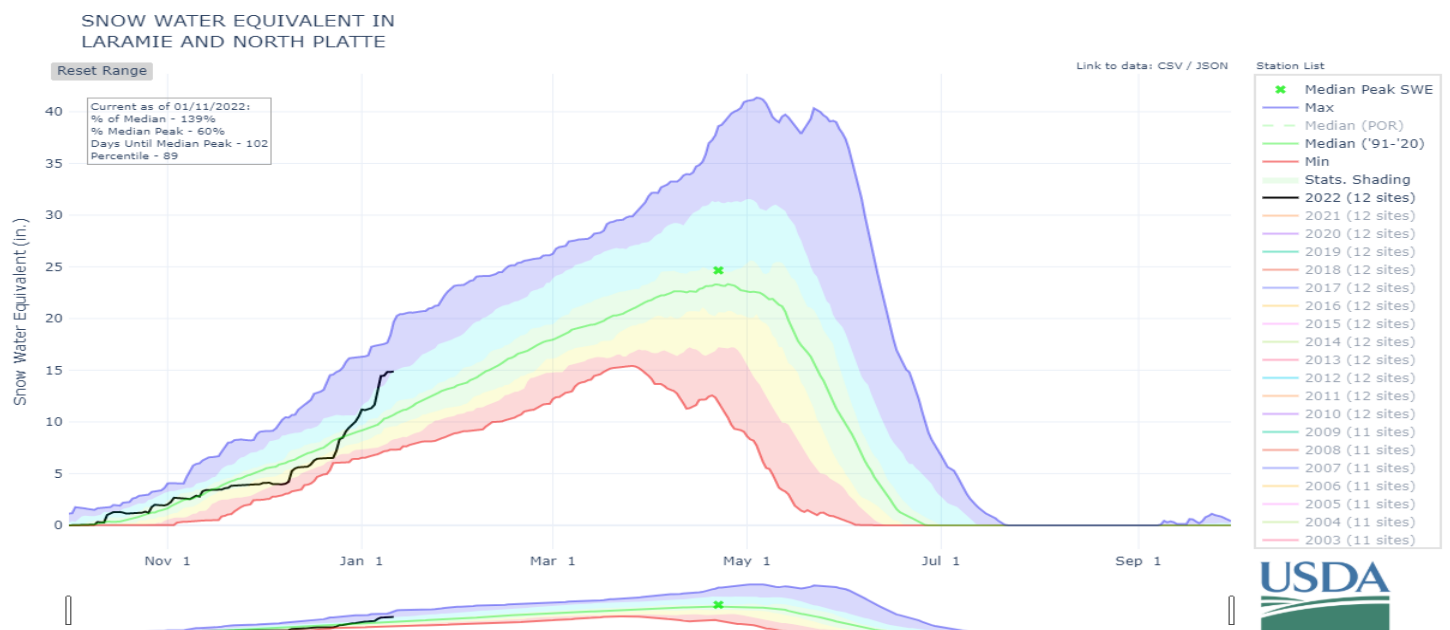
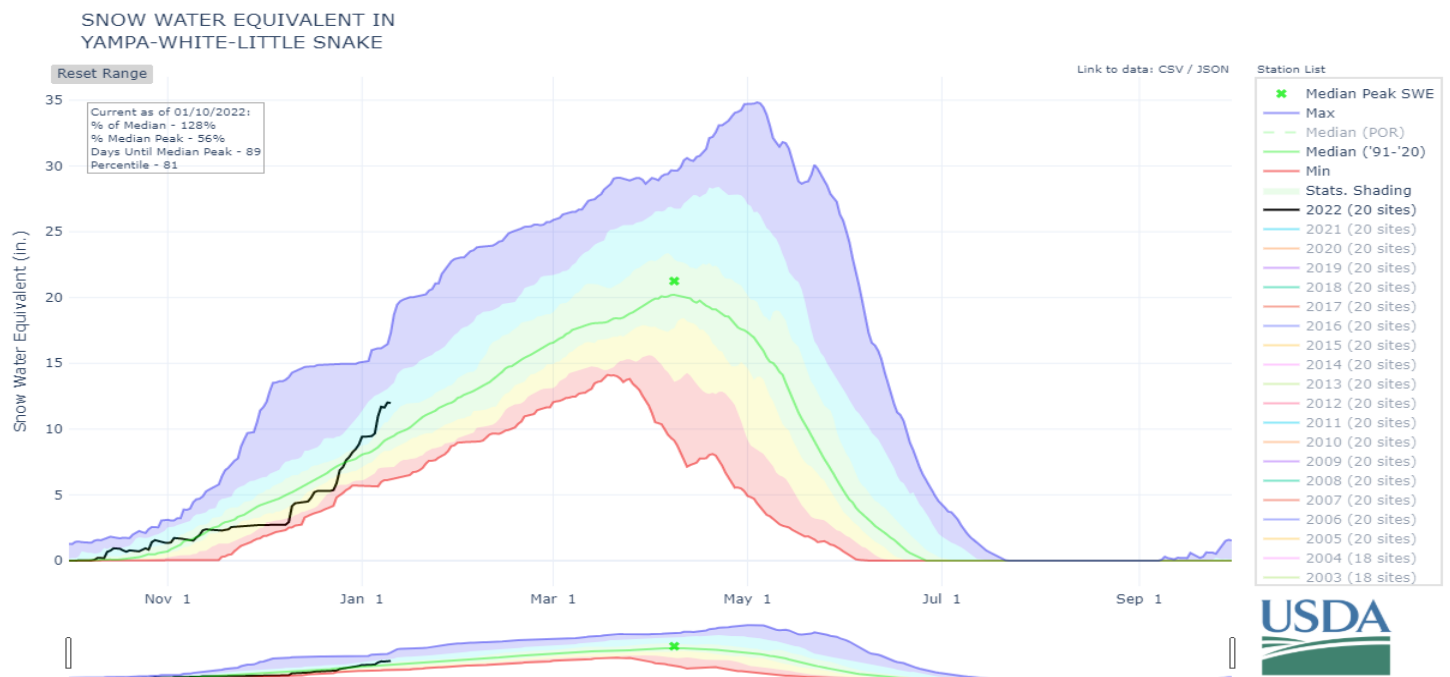
Some forecasts may be for volumes that are regulated or influenced by diversions and water management.

YAMPA-WHITE-LITTLE SNAKE AND LARAMIE-NORTH PLATTE RIVER BASINS

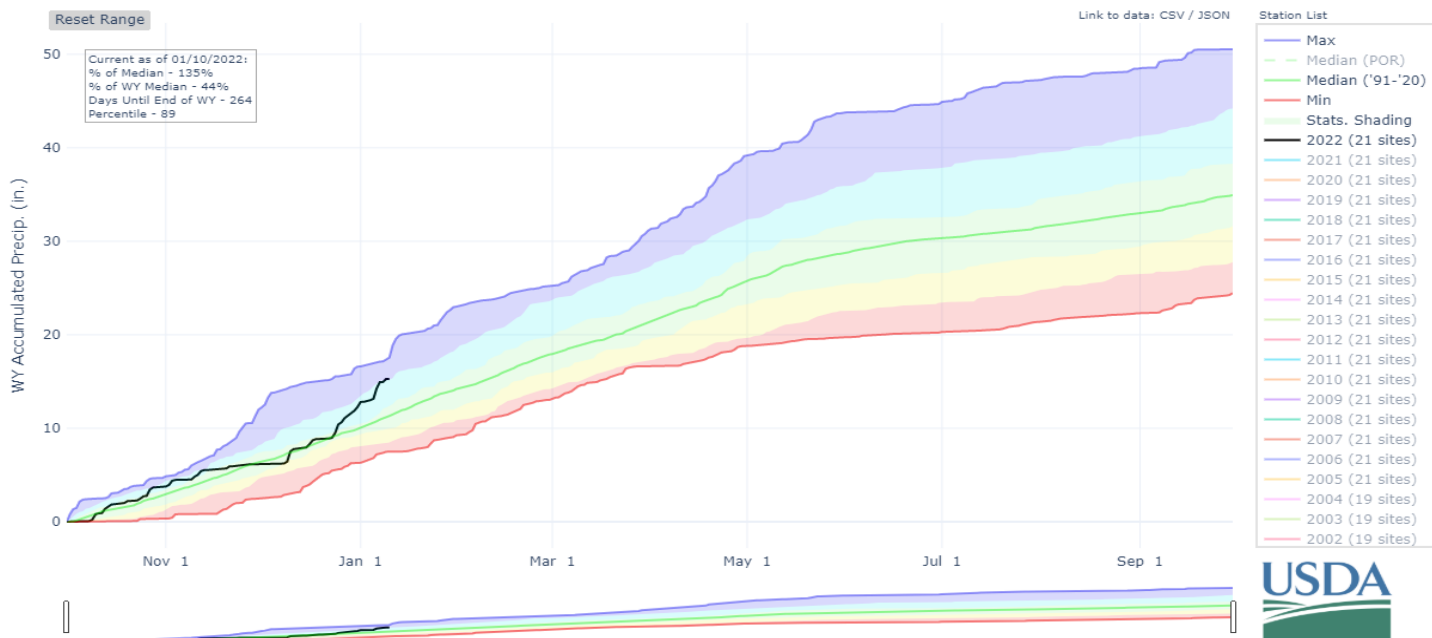
January 1st, 2022

Snowpack in the Yampa-White-Little Snake and the Laramie-North Platte River basins were both above normal at 117% and 122% of the median. Precipitation for December was 181% and 190% of median and water year-to-date precipitation is 127% and 125% of median, respectively. Reservoir storage at the end of December for the Yampa-White-Little Snake was 77% of median compared to 97% last year. Current streamflow forecasts range from 110% of median at White River near Meeker to 149% of median at Little Snake River near Lily.

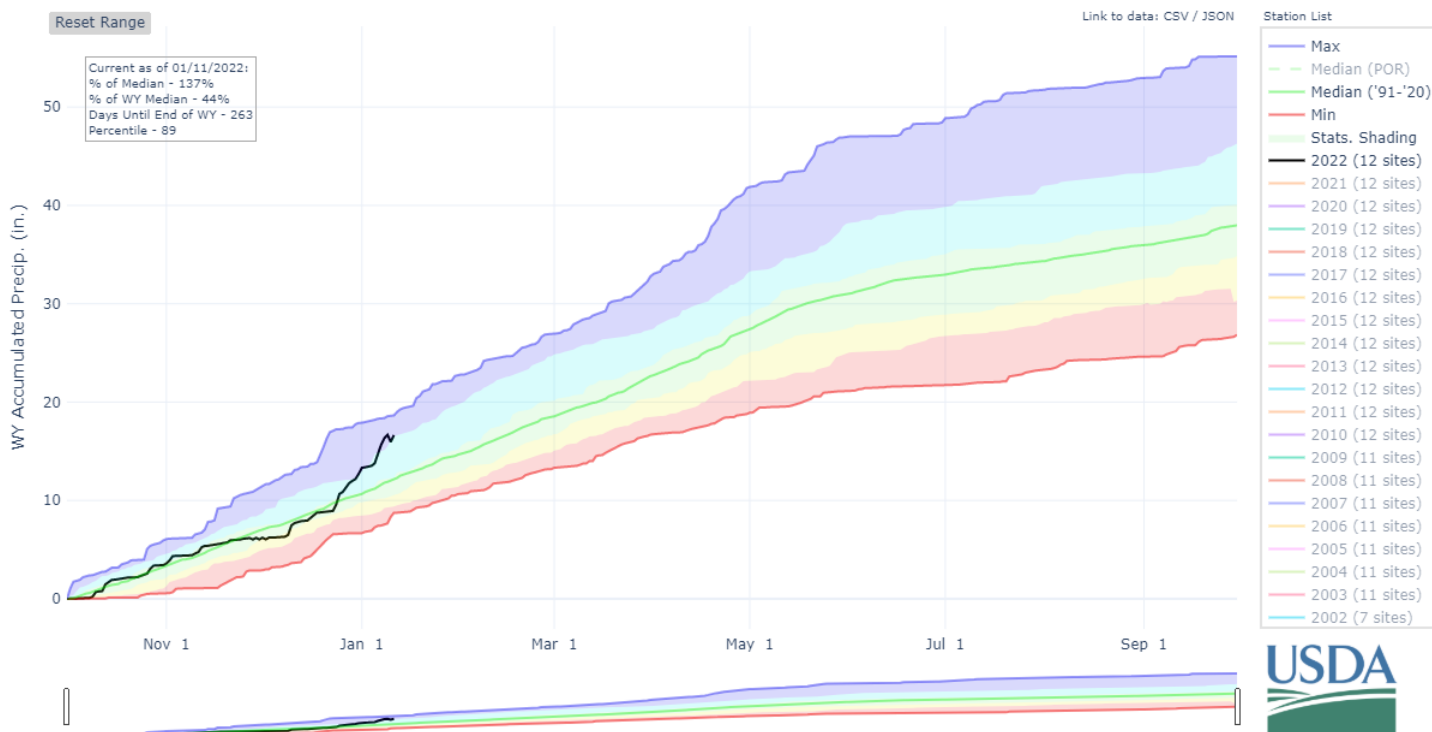
*SWE values calculated using daily SNOTEL data only

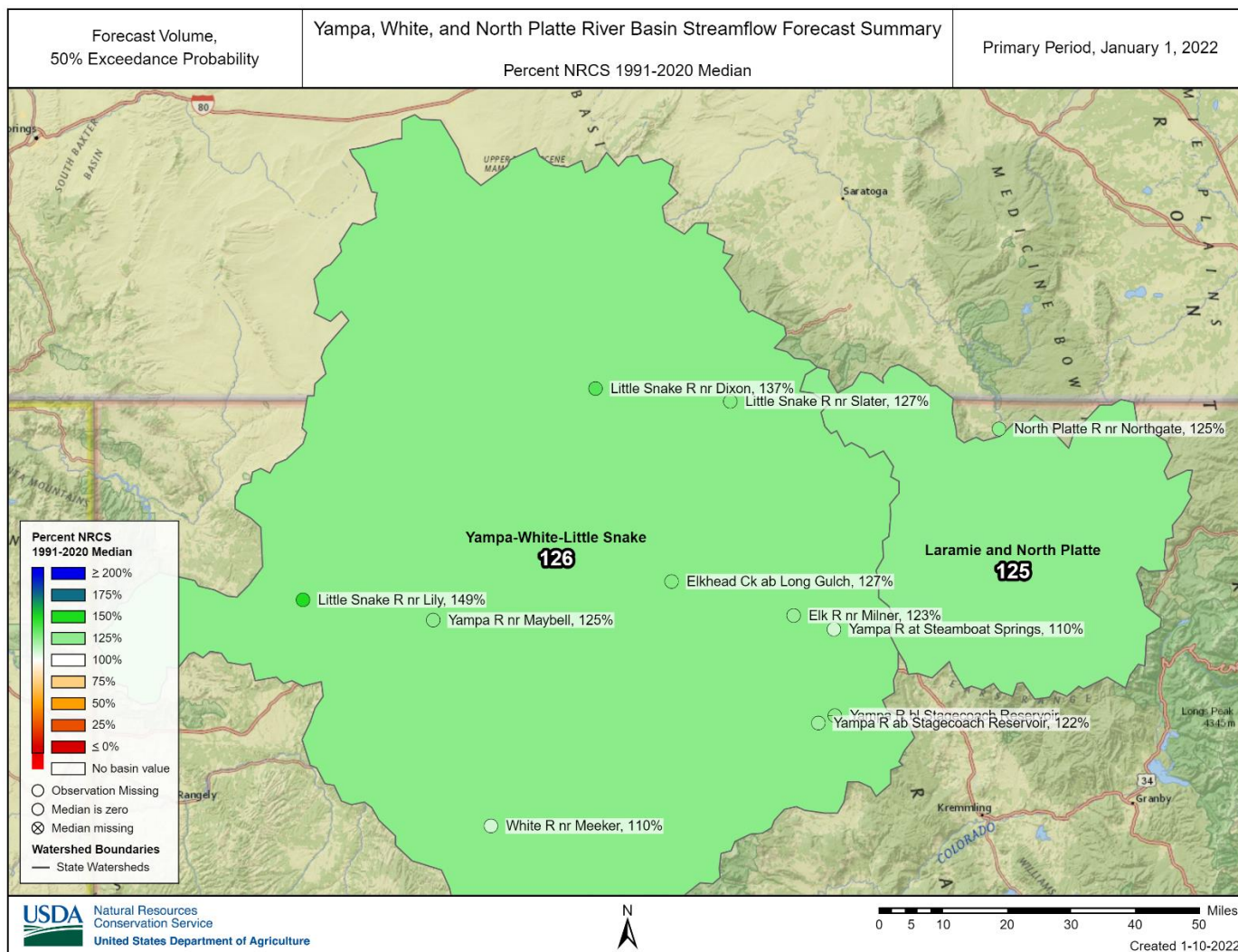


PRECIPITATION IN YAMPA-WHITE-LITTLE SNAKE



PRECIPITATION IN LARAMIE AND NORTH PLATTE





Reservoir Conditions for Yampa-White-Little Snake on January 1st 2022



*No reservoirs are currently monitored in the Laramie-North Platte combined basin.

Watershed Snowpack Analysis January 1st, 2022

Sub-Basin	# of Sites	Last Year %	
		% Median	Median
Laramie	2	133	85
North Platte	8	120	77
Total Laramie & North Platte	10	122	79
Elk	2	136	73
Yampa	9	118	71
White	3	111	76
Total Yampa & White	11	114	72
Little Snake	7	129	85
Basin-Wide Total	25	120	78

*SWE values calculated using first of month SNOTEL data and snow course measurements

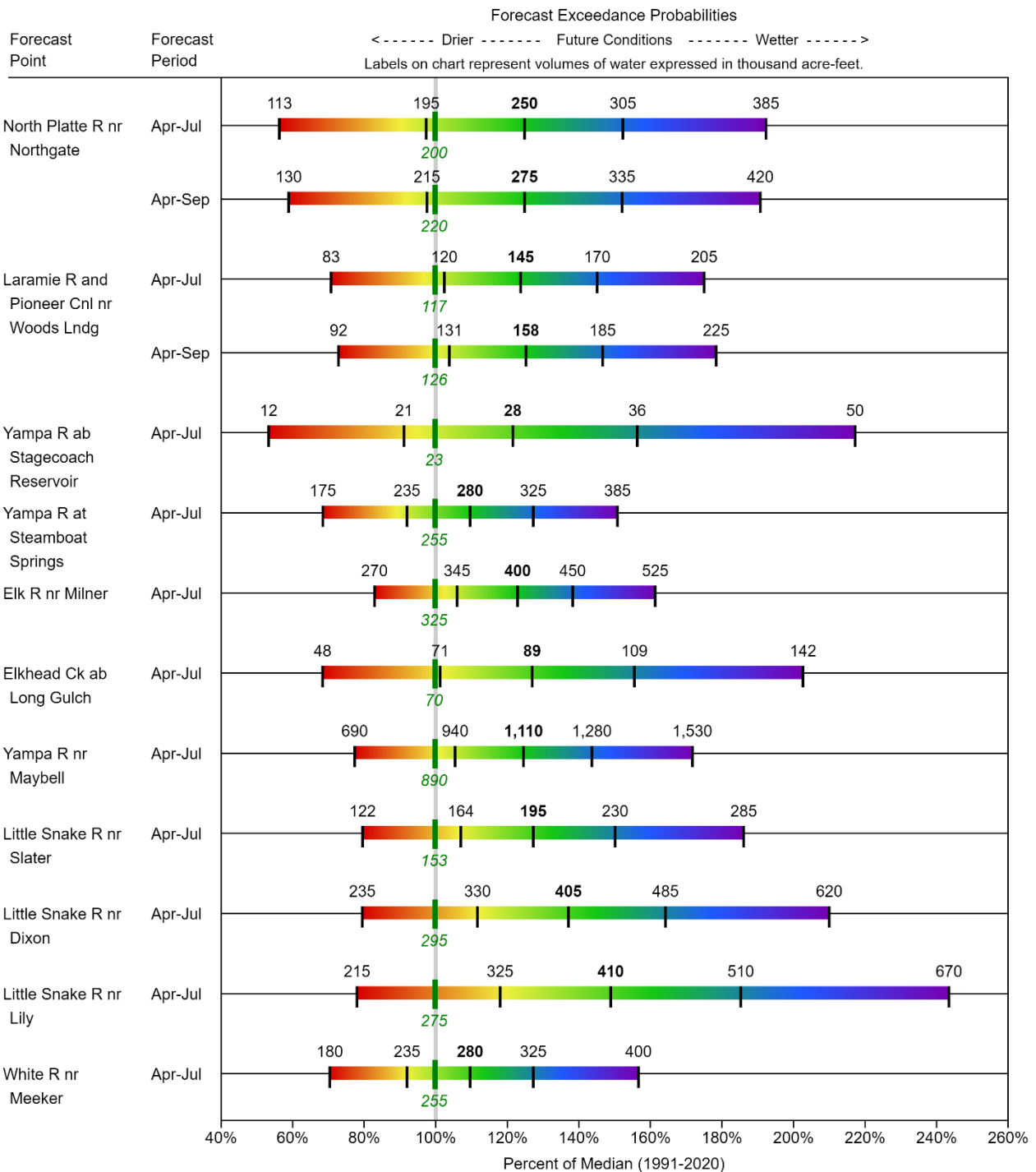
Reservoir Storage End of December 2021

Reservoir	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
STAGECOACH RESERVOIR NR OAK CREEK	32.5	35.2	29.3	36.5
YAMCOLO RESERVOIR	4.2	7.7	5.3	8.7
BASINWIDE	36.7	42.9	34.6	45.2
Number of Reservoirs	2	2	2	2

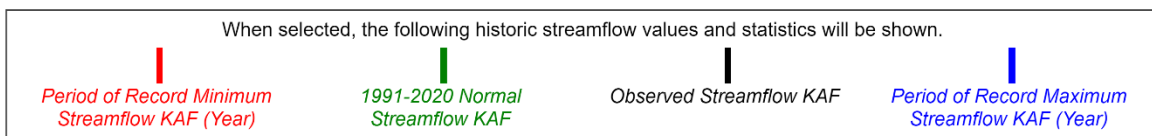
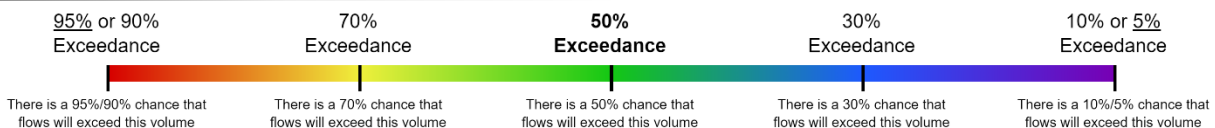
YAMPA-WHITE-NORTH PLATTE RIVER BASINS

Water Supply Forecasts

January 1, 2022



Legend

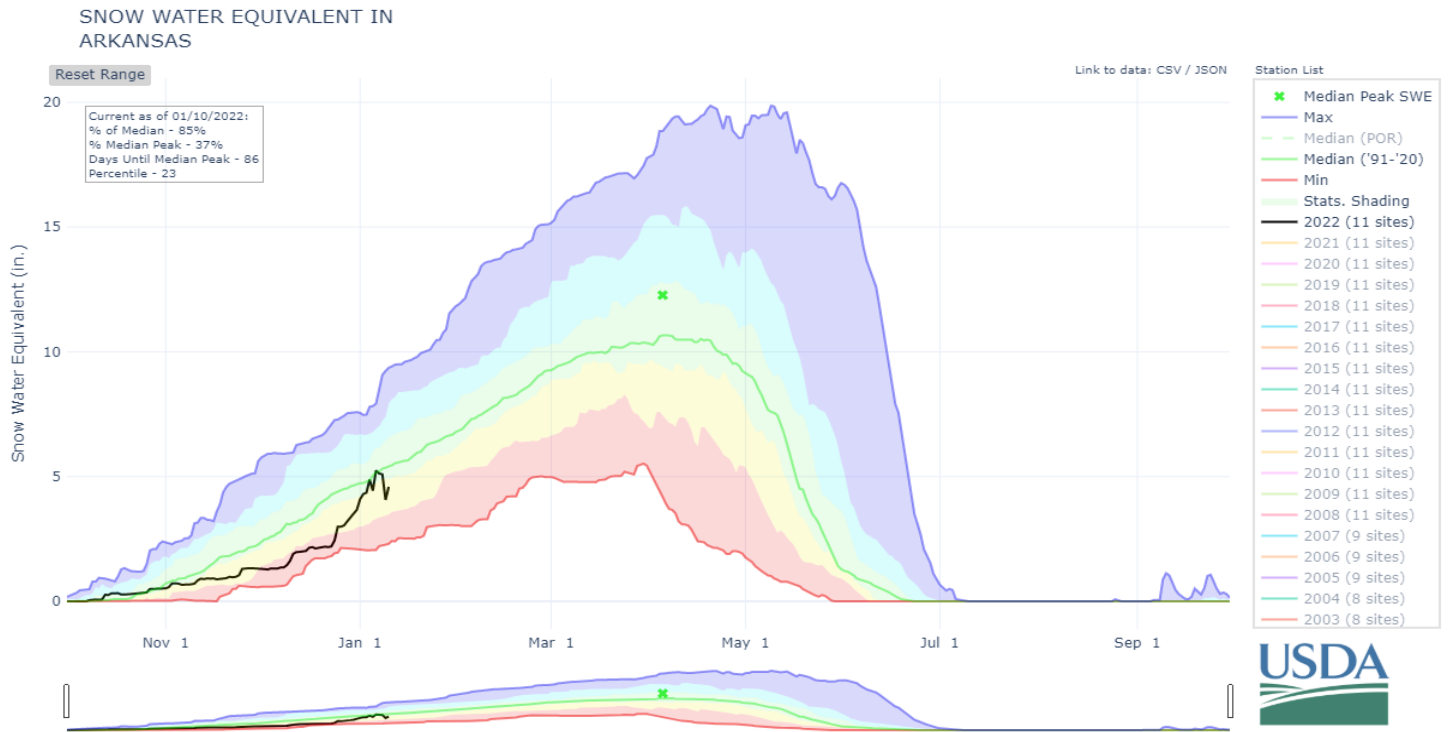


Some forecasts may be for volumes that are regulated or influenced by diversions and water management.

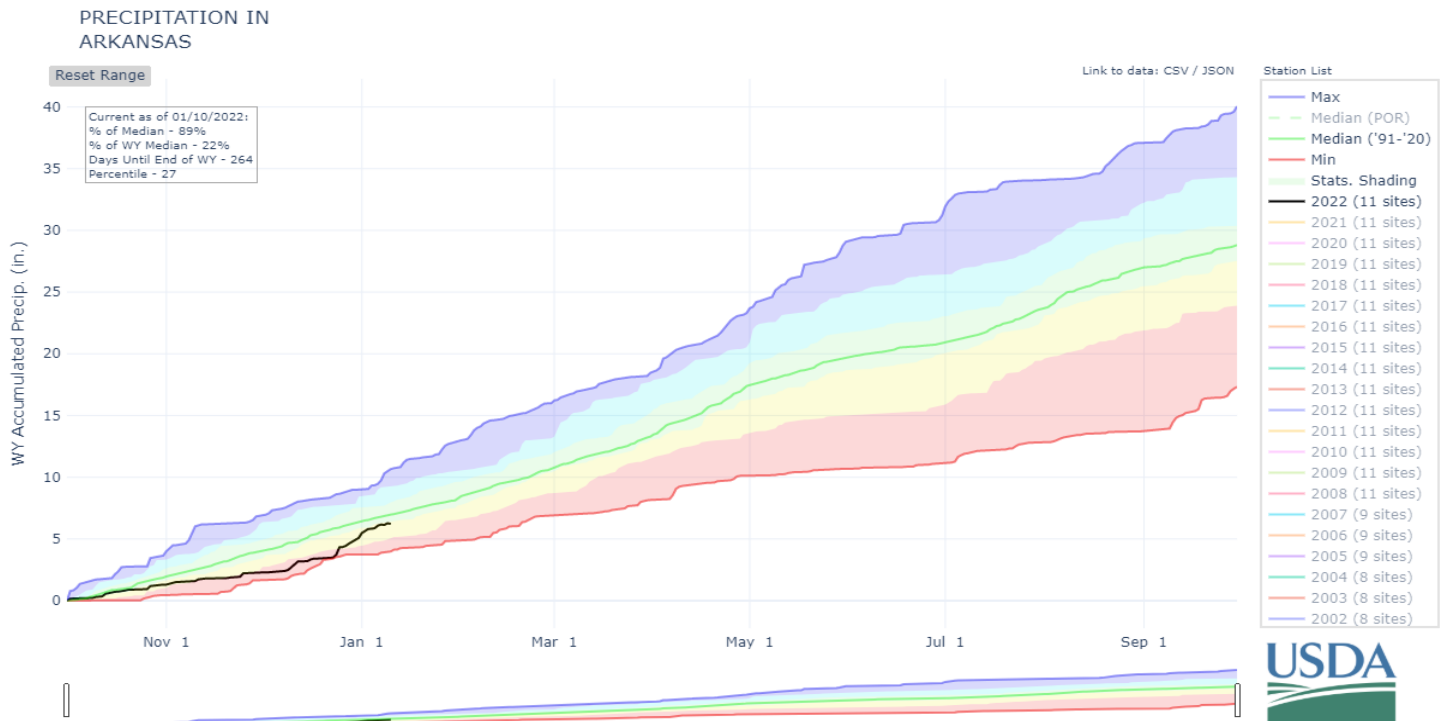
ARKANSAS RIVER BASIN

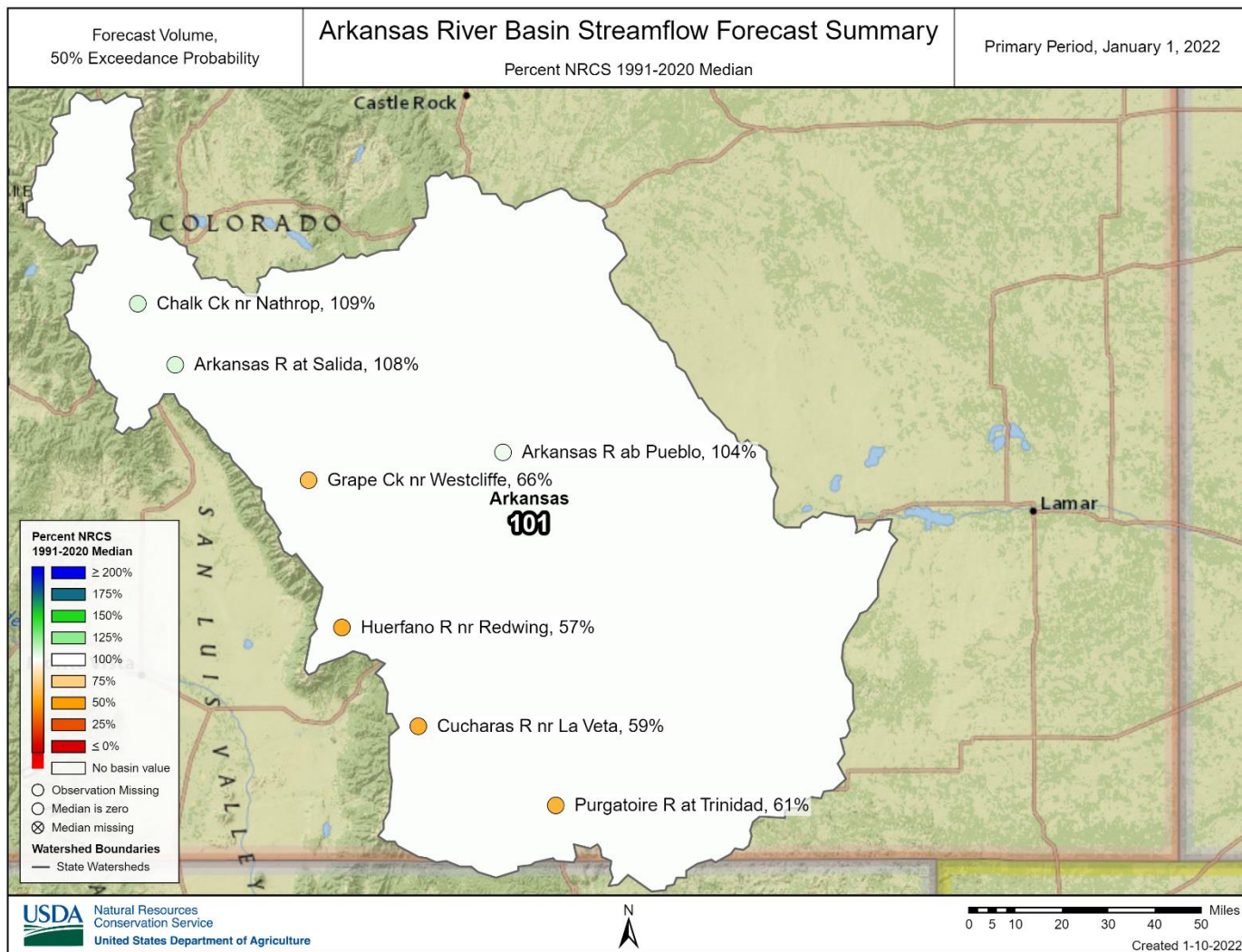
January 1st, 2022

Snowpack in the Arkansas River basin is below normal at 86% of median. Precipitation for December was 147% of median which brings water year-to-date precipitation to 85% of median. Reservoir storage at the end of December was 91% of median compared to 88% last year. Current streamflow forecasts range from 53% of median at Huerfano River near Redwing to 111% of median at Arkansas River at Salida.

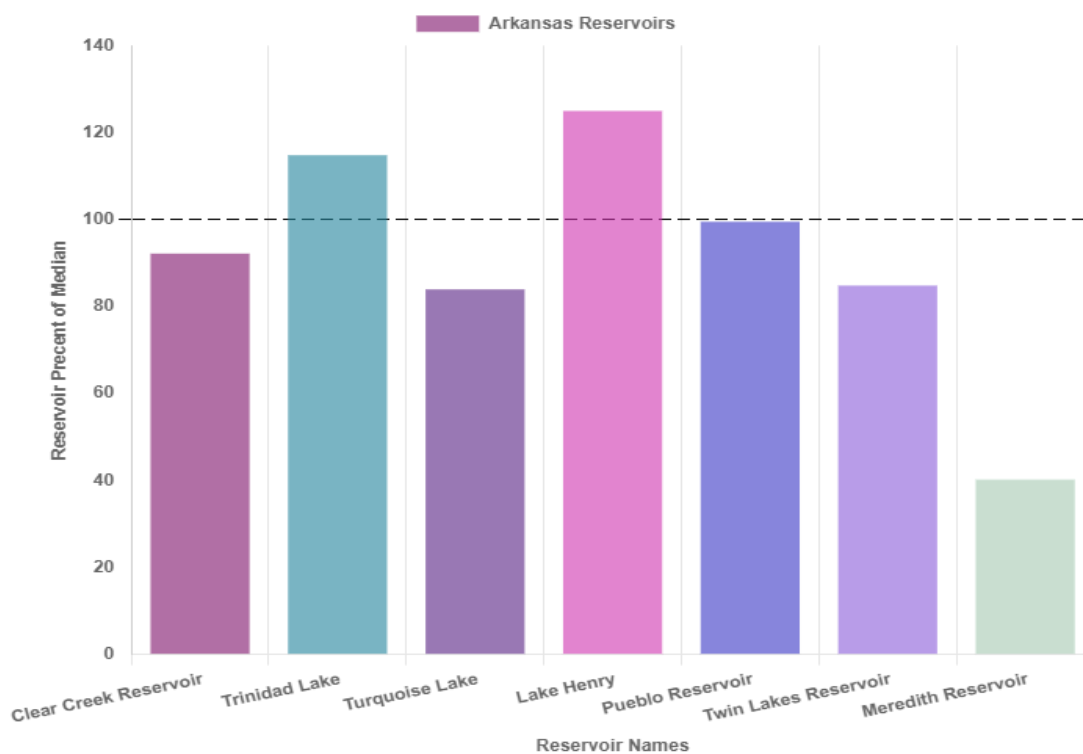


*SWE values calculated using daily SNOTEL data only





Reservoir Conditions for Arkansas on January 1st 2022



Watershed Snowpack Analysis January 1st, 2022

Sub-Basin	# of Sites	% Median	Last Year %	
			Median	
Upper Arkansas	3	131	83	
Cucharas & Huerfano	3	60	122	
Purgatoire	2	46	108	
Basin-Wide Total	8	90	99	

*SWE values calculated using first of month SNOTEL data and snow course measurements

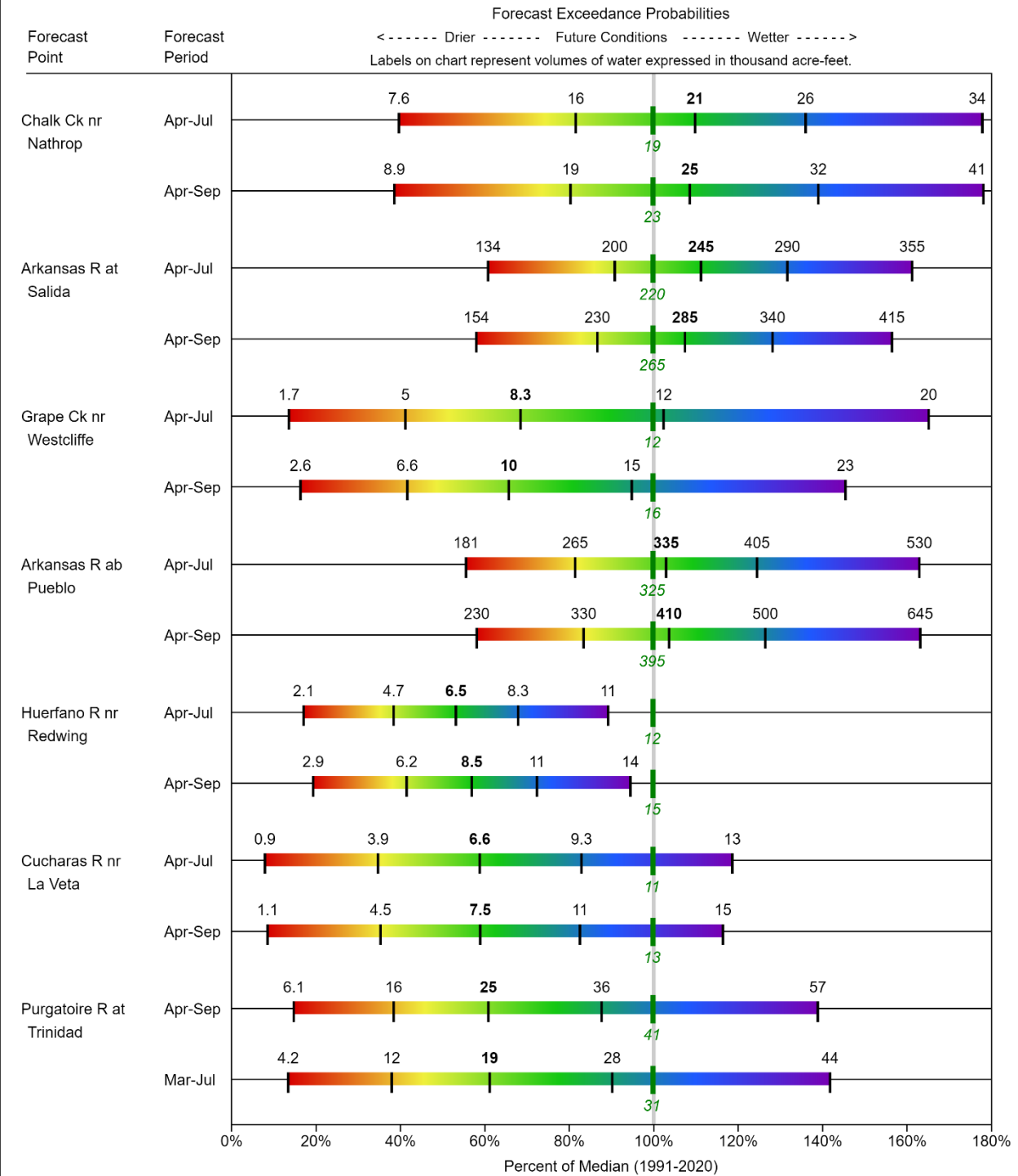
Reservoir Storage End of December 2021

Reservoir	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
ADOBE CREEK RESERVOIR	26.9	23.0	32.7	62.0
CLEAR CREEK RESERVOIR	5.4	7.2	6.7	11.4
CUCHARAS RESERVOIR				40.0
GREAT PLAINS RESERVOIR				150.0
HOLBROOK LAKE	0.0	4.1	2.5	7.0
HORSE CREEK RESERVOIR	0.0	3.5	9.4	27.0
JOHN MARTIN RESERVOIR	42.6	90.1	122.8	616.0
LAKE HENRY	4.9	4.1	3.7	9.4
MEREDITH RESERVOIR	9.2	42.1	19.7	42.0
PUEBLO RESERVOIR	191.6	223.0	170.8	354.0
TRINIDAD LAKE	16.2	21.9	24.4	167.0
TURQUOISE LAKE	72.9	97.2	94.1	127.0
TWIN LAKES RESERVOIR	31.3	45.8	57.0	86.0
BASINWIDE	401.1	562.1	543.8	1698.8
Number of Reservoirs	11	11	11	13

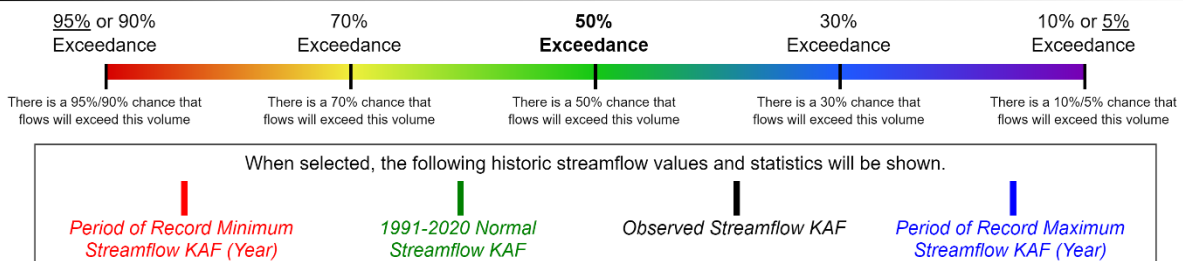
ARKANSAS RIVER BASIN

Water Supply Forecasts

January 1, 2022



Legend

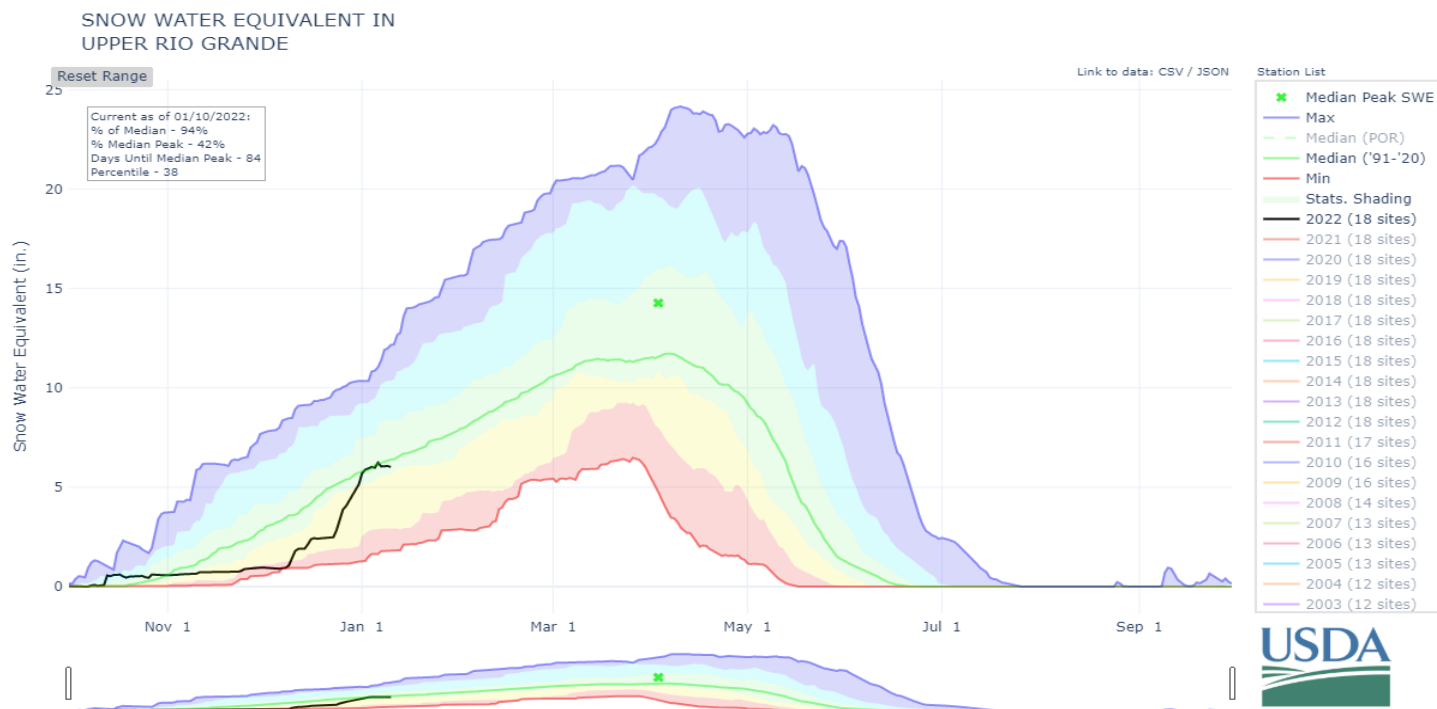


Some forecasts may be for volumes that are regulated or influenced by diversions and water management.

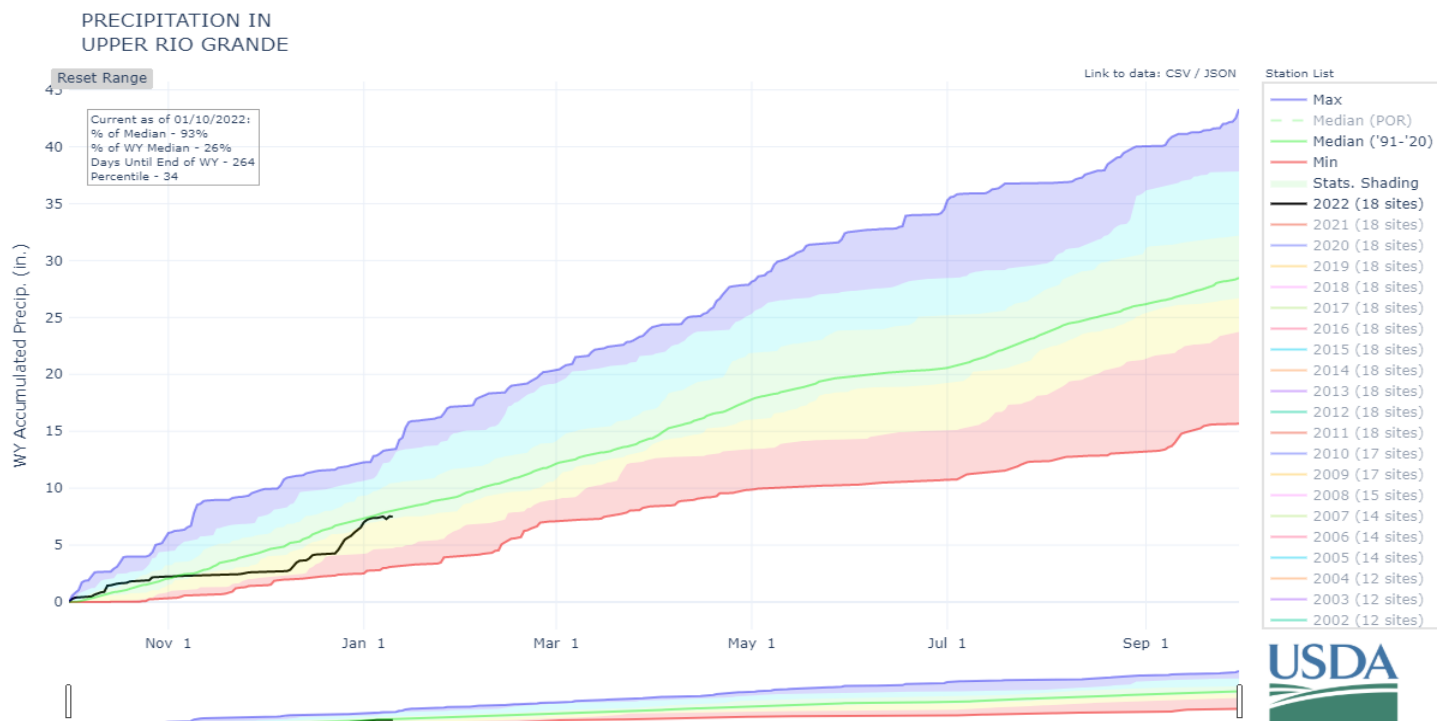
UPPER RIO GRANDE RIVER BASIN

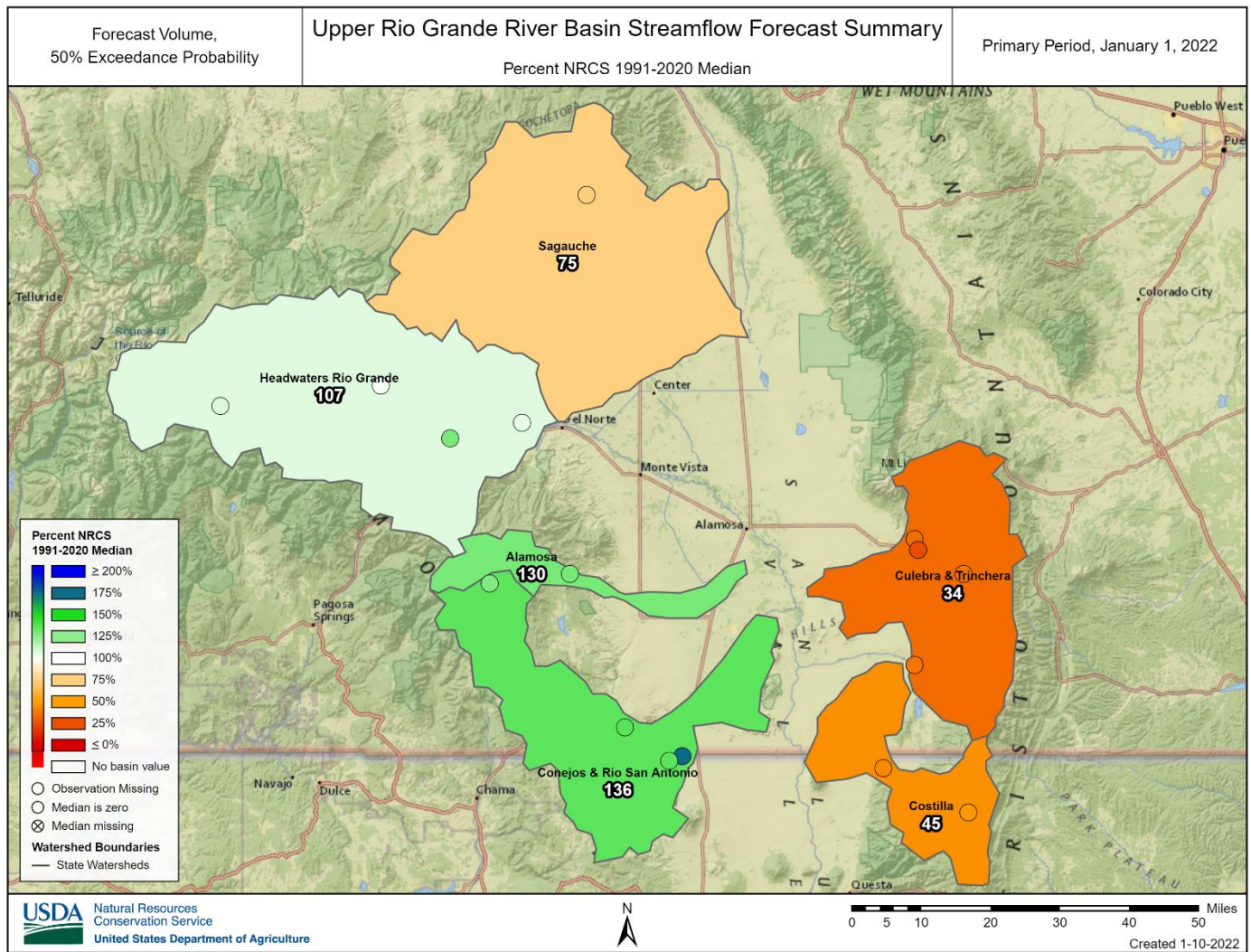
January 1st, 2022

Snowpack in the Upper Rio Grande River basin is near normal at 98% of median. Precipitation for December was 189% of median which brings water year-to-date precipitation to 96% of median. Reservoir storage at the end of December was 93% of median compared to 86% last year. Current streamflow forecasts range from 24% of median at Sangre De Cristo Creek to 176% of median at San Antonio River at Ortiz.

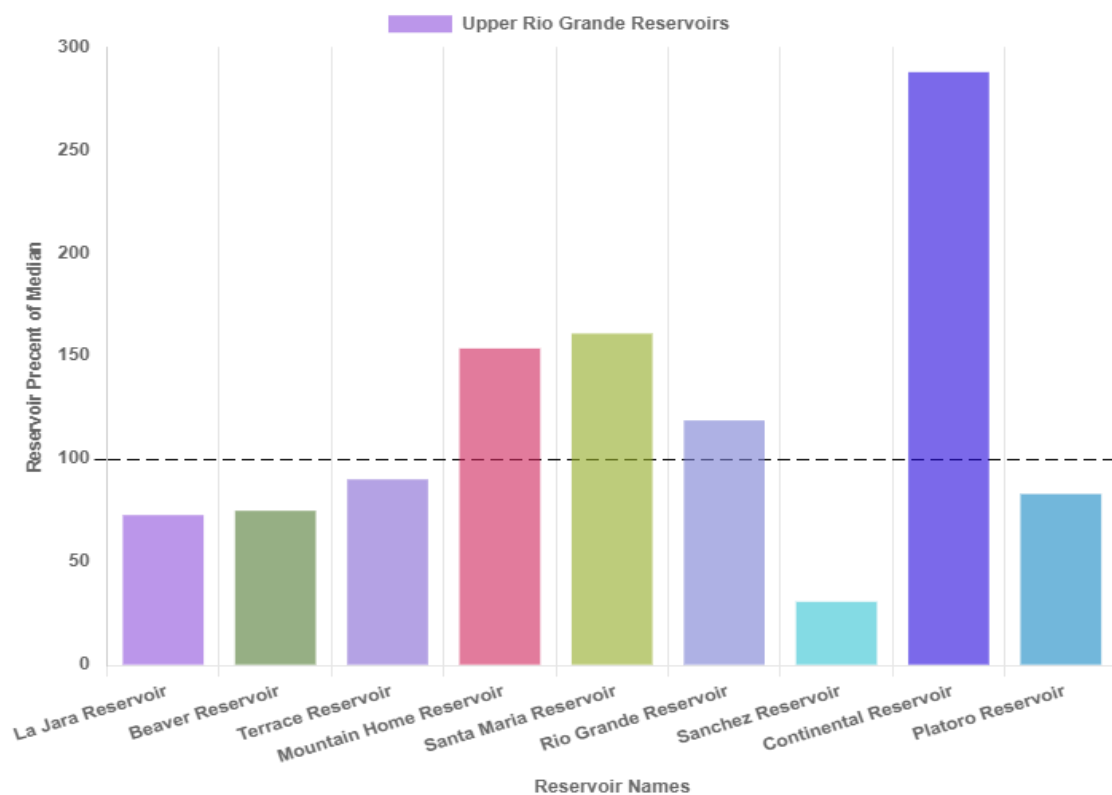


*SWE values calculated using daily SNOTEL data only





Reservoir Conditions for Upper Rio Grande on January 1st 2022



Watershed Snowpack Analysis January 1st, 2022

Sub-Basin	# of Sites	Last Year %	
		% Median	Median
Alamosa Creek	1	132	109
Conejos & Rio San Antonio	2	152	105
Culebra & Trinchera Creek	3	48	152
Upper Rio Grande	5	122	102
Basin-Wide Total	11	111	114

*SWE values calculated using first of month SNOTEL data and snow course measurements

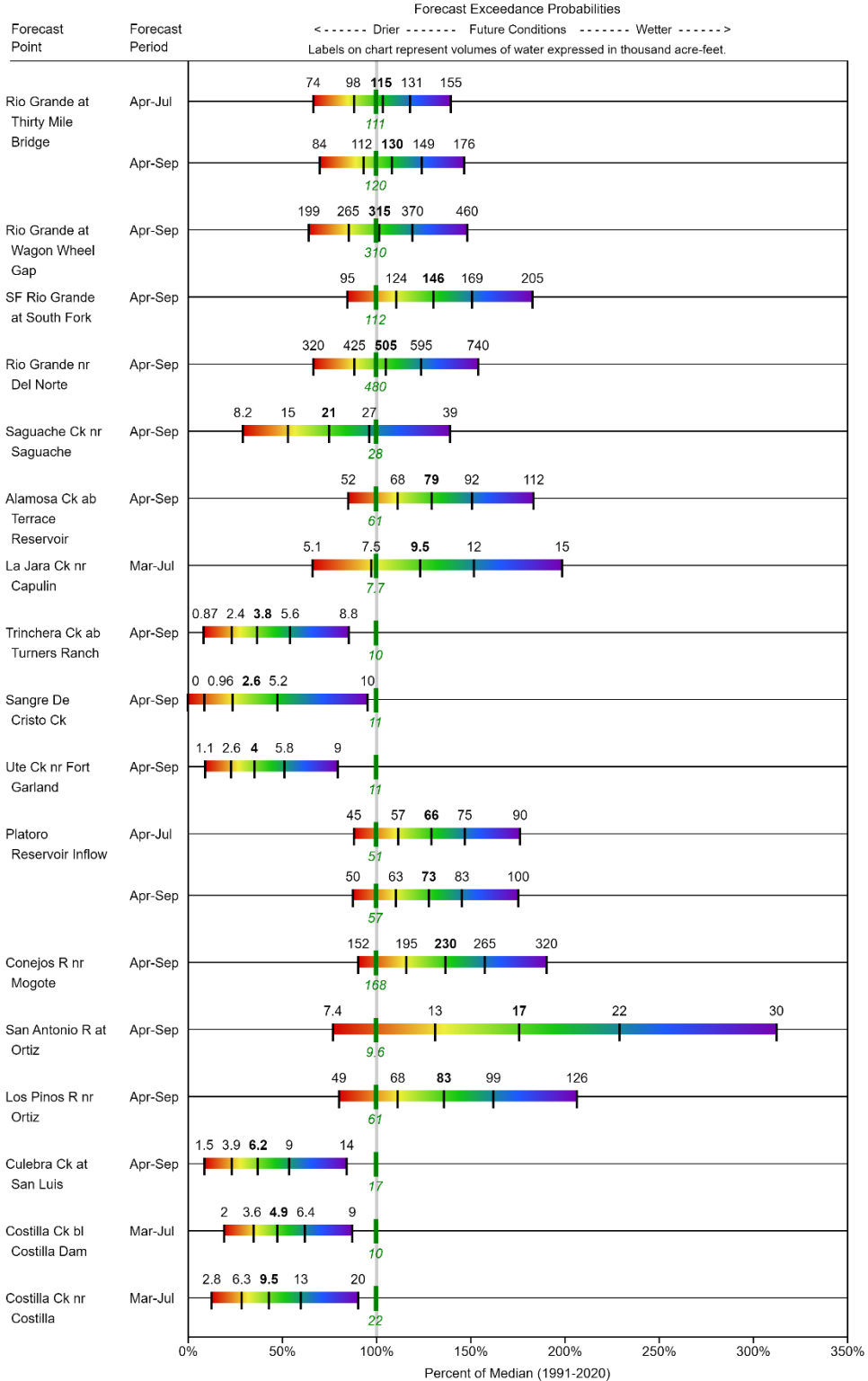
Reservoir Storage End of December 2021

Reservoir	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
CONTINENTAL RESERVOIR	8.0	15.0	3.8	27.0
PLATORO RESERVOIR	14.2	18.6	24.0	60.0
RIO GRANDE RESERVOIR	16.8	0.0	14.8	51.0
SANCHEZ RESERVOIR	4.0	8.0	27.5	103.0
SANTA MARIA RESERVOIR	13.6	21.5	10.4	45.0
TERRACE RESERVOIR	4.3	7.1	5.5	18.0
BEAVER RESERVOIR	3.5	3.8	4.1	4.5
BASINWIDE	64.4	74.0	90.1	308.5
Number of Reservoirs	7	7	7	7

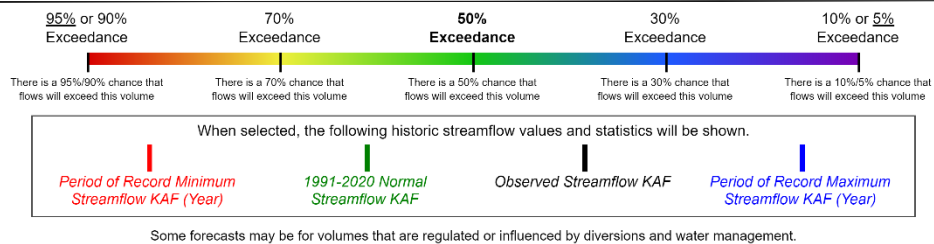
UPPER RIO GRANDE BASIN

Water Supply Forecasts

January 1, 2022



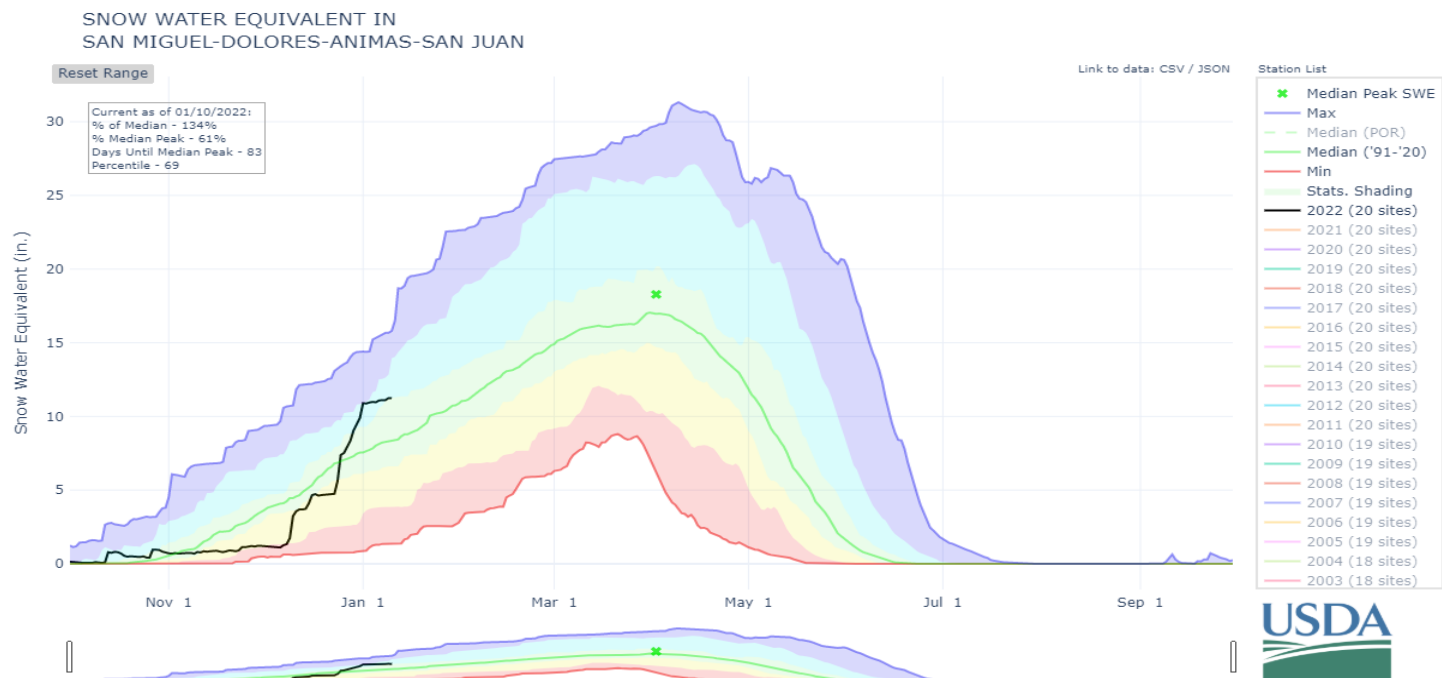
Legend



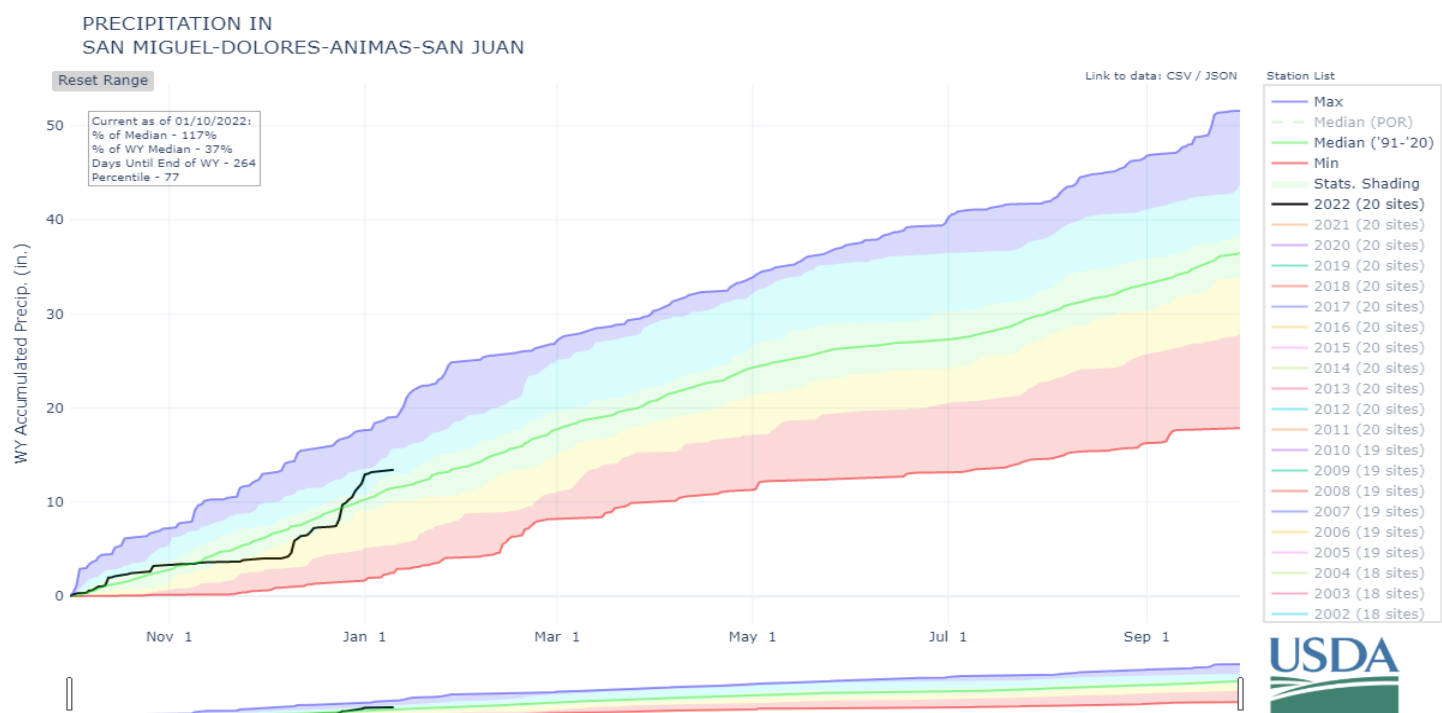
SAN MIGUEL-DOLORES-ANIMAS-SAN JUAN COMBINED RIVER BASIN

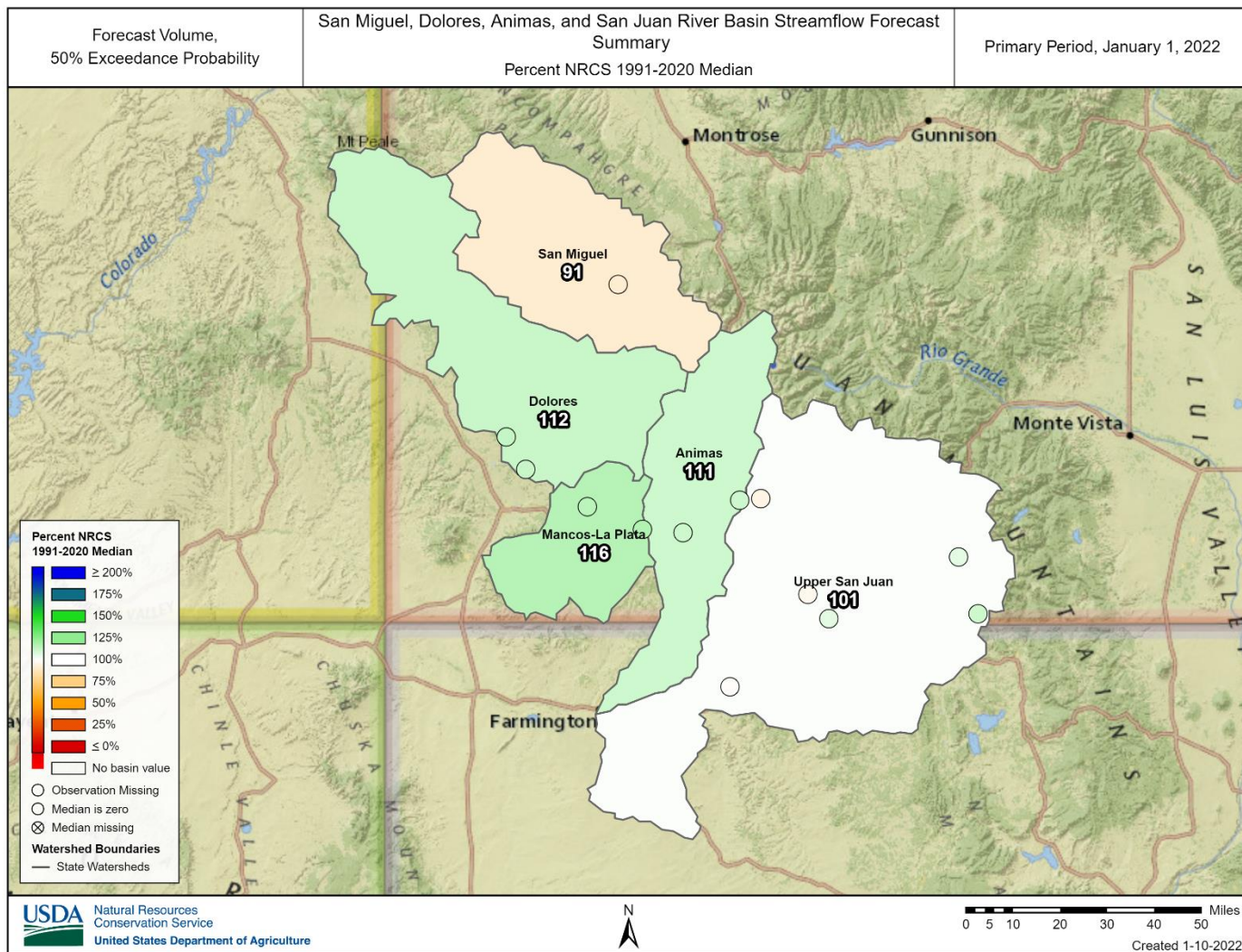
January 1st, 2022

Snowpack in the combined southwest river basins is above normal at 144% of median. Precipitation for December was 300% of median which brings water year-to-date precipitation to 126% of median. Reservoir storage at the end of December was 64% of median compared to 76% last year. Current streamflow forecasts range from 91% of median at San Miguel River near Placerville to 117% of median at La Plata River at Hesperus.

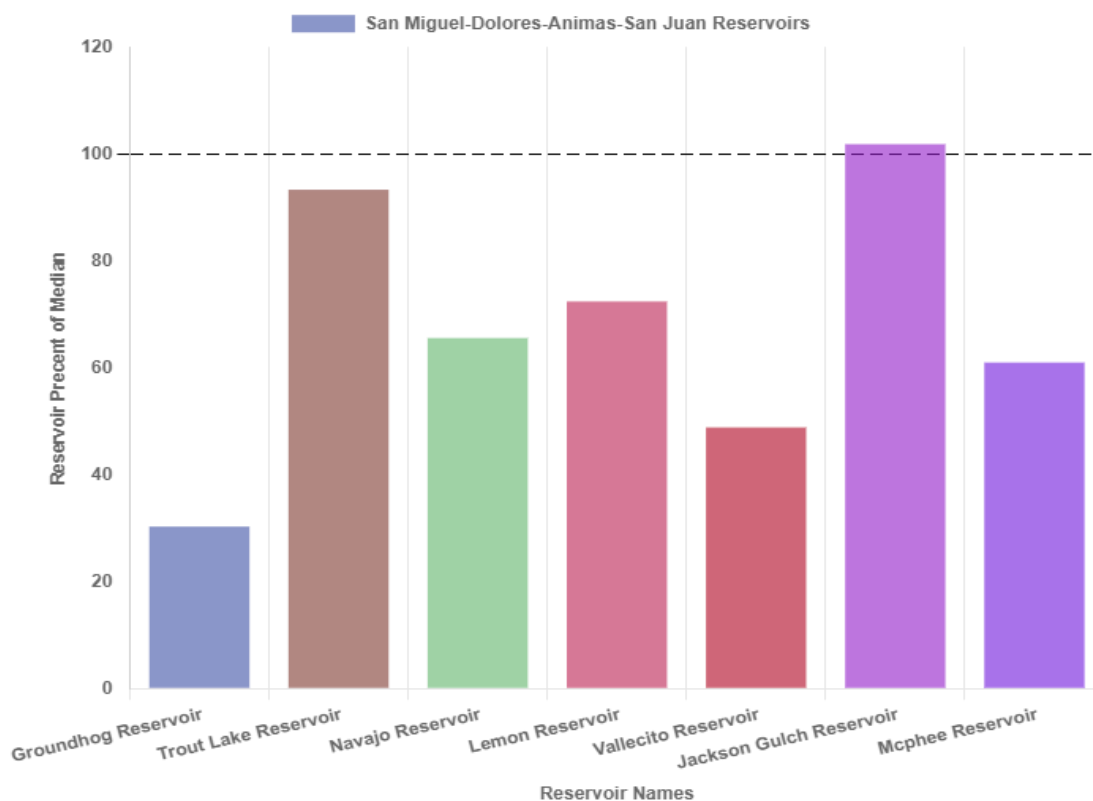


*SWE values calculated using daily SNOTEL data only





Reservoir Conditions for San Miguel-Dolores-Animas-San Juan on January 1st 2022



Watershed Snowpack Analysis January 1st, 2022

Sub-Basin	# of Sites	% Median	Last Year %
			Median
Animas	9	129	75
Dolores	5	157	66
San Miguel	3	168	71
San Juan	3	136	100
Basin-Wide Total	19	140	79

*SWE values calculated using first of month SNOTEL data and snow course measurements

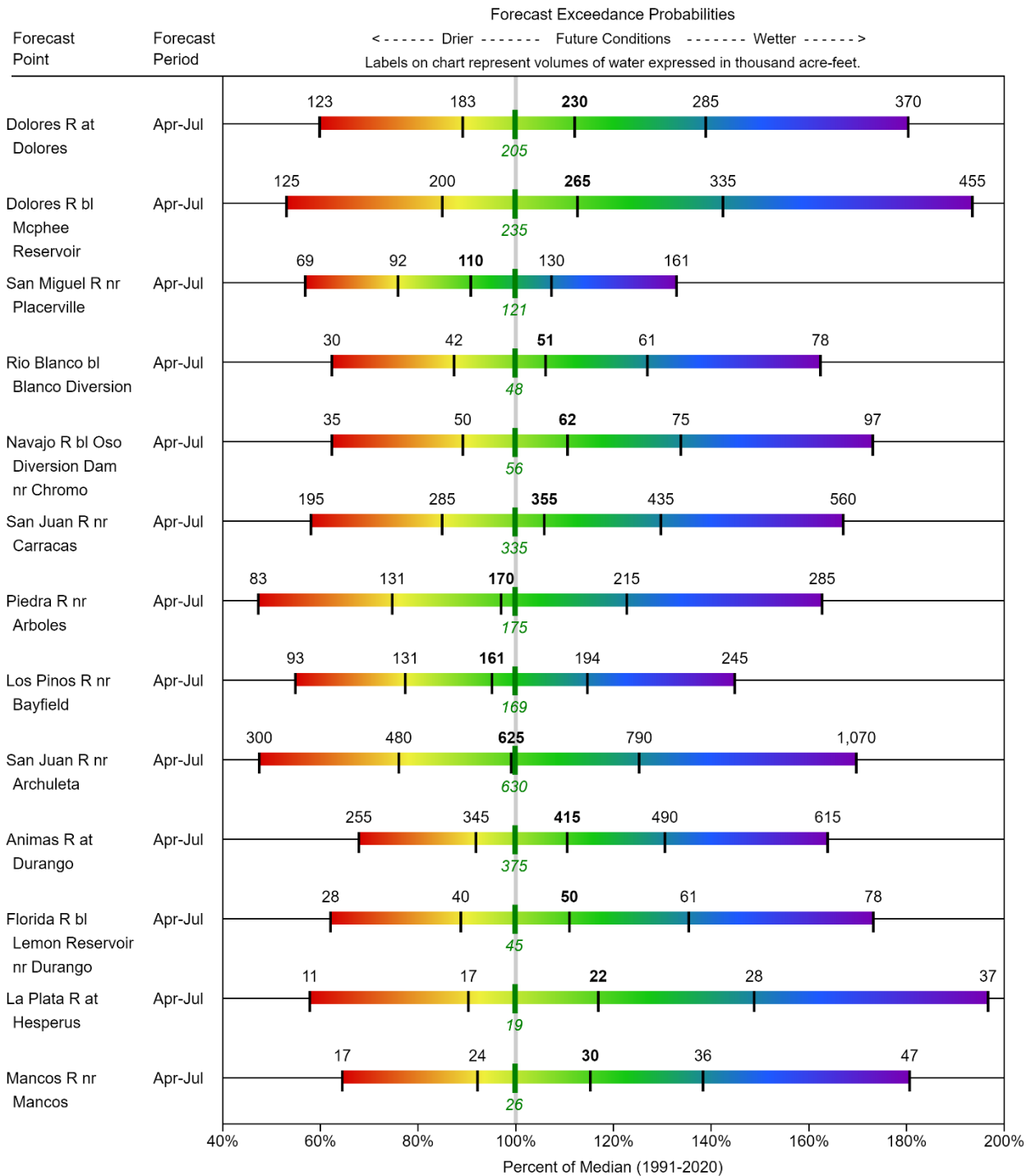
Reservoir Storage End of December 2021

Reservoir	Current (KAF)	Last Year (KAF)	Average (KAF)	Capacity (KAF)
GROUNDHOG RESERVOIR	4.5	16.0	12.3	22.0
JACKSON GULCH RESERVOIR	2.7	3.7	4.5	10.0
LEMON RESERVOIR	10.6	17.6	20.7	40.0
MCPHEE RESERVOIR	167.8	288.8	265.6	381.0
NARRAGUINNEP RESERVOIR	4.0	5.0	14.1	19.0
VALLECITO RESERVOIR	35.8	75.4	62.4	126.0
TROUT LAKE RESERVOIR	2.3	2.7	2.5	3.2
BASINWIDE	227.7	409.4	382.1	601.2
Number of Reservoirs	7	7	7	7

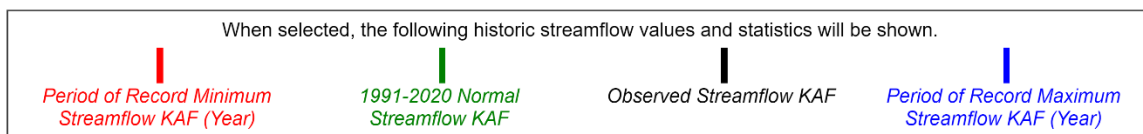
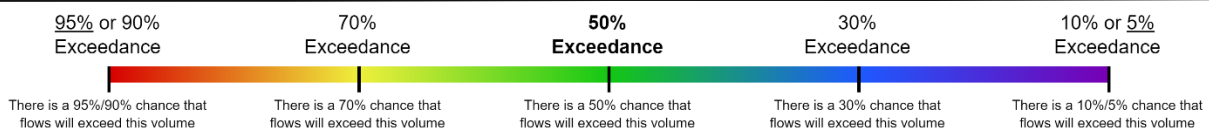
SAN MIGUEL-DOLORES-ANIMAS-SAN JUAN RIVER BASINS

Water Supply Forecasts

January 1, 2022



Legend



Some forecasts may be for volumes that are regulated or influenced by diversions and water management.

How to Read Snowpack Graphs

The graphs show snow water equivalent (SWE) (in inches), using daily SNOTEL data. for the October 1 through September 30 water year. Basin “observed” SWE values are computed using SNOTEL sites which are characteristic of the snowpack of the particular basin.

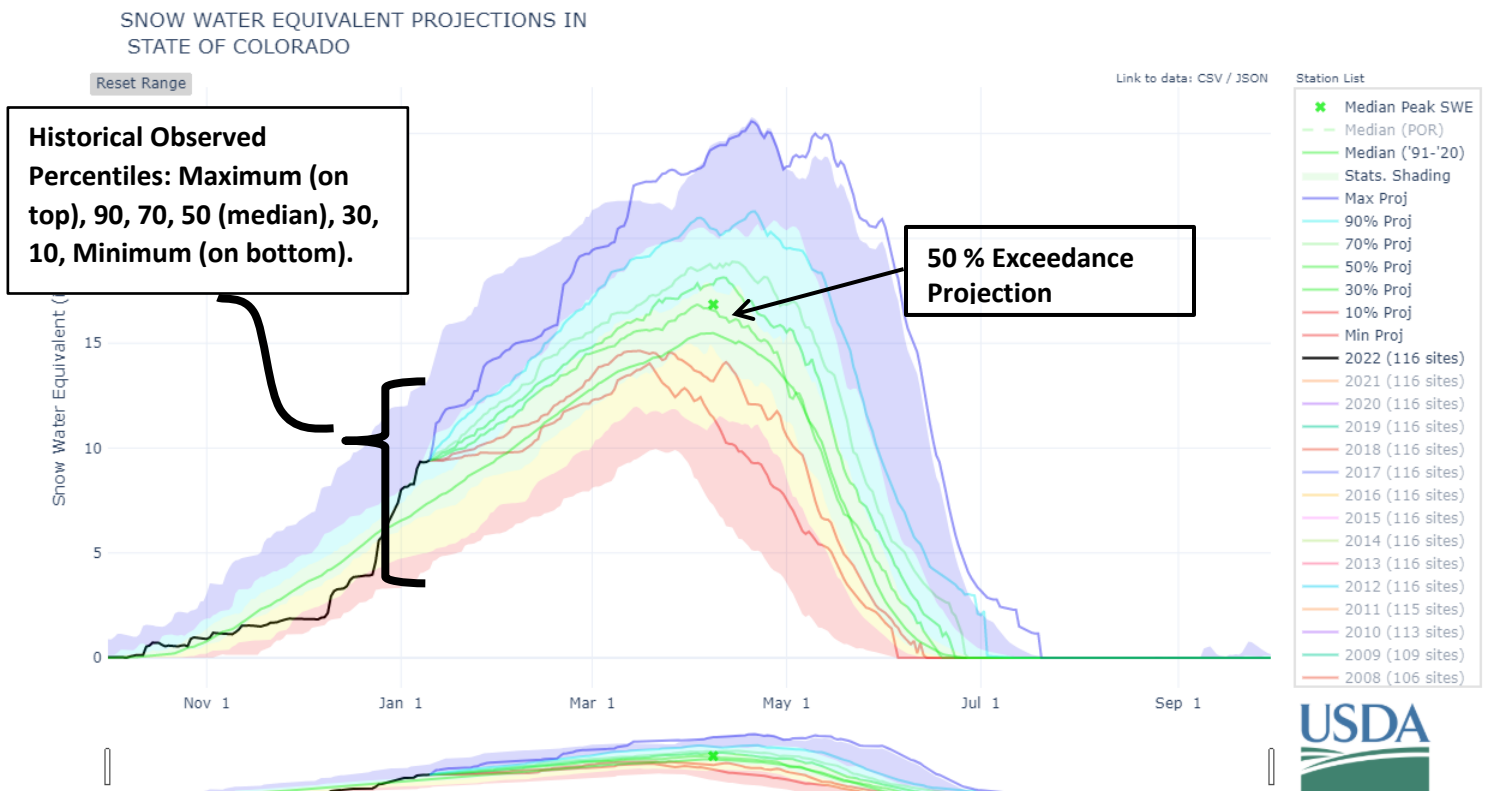
Current water year is represented by the heavy red line terminating on the last day the graphic was updated.

Historical observed percentile range is shown as a gray background area on the graph. Shades of gray indicate maximum, 90 percentile, 70 percentile, 50 percentile (solid black line), 30 percentile, 10 percentile, and minimum for the period of record.

50 % Exceedance Projection: The most probabilistic snowpack projection, based on the median snowpack is projected forward from the end of the current period to the end of the current water year.

For more detailed information on these graphs visit:

http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs144p2_062291.pdf



How Forecasts Are Made

For more water supply and resource management information, contact:

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PO Box 25426

Denver, CO 80225-0426

Phone (720) 544-2852

Website: <http://www.nrcs.usda.gov/wps/portal/nrcs/main/co/snow/>

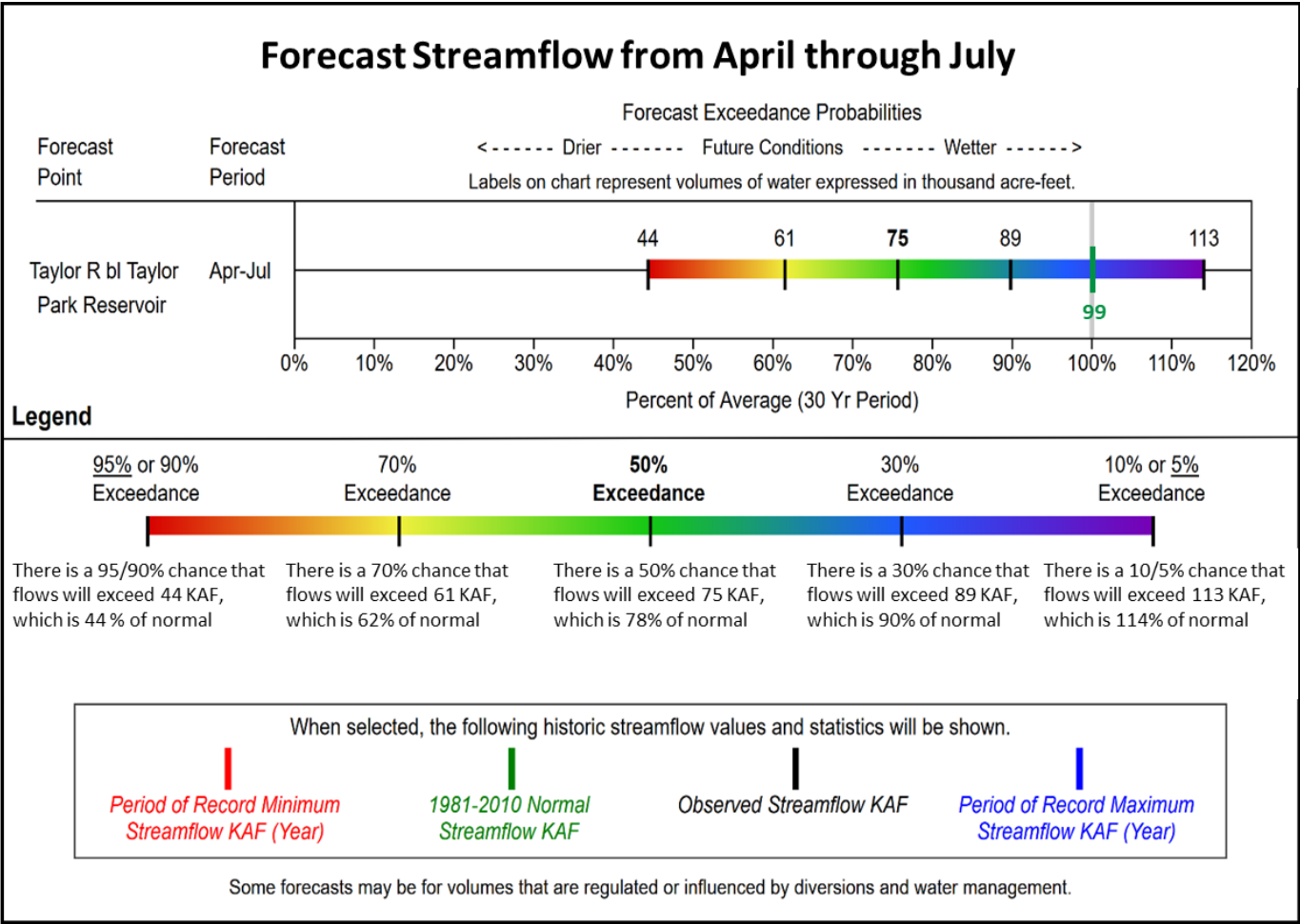
Most of the annual streamflow in the western United States originates as snowfall that has accumulated in the mountains during the winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Measurements of snow water equivalent at selected manual snow courses and automated SNOTEL sites, along with precipitation, antecedent streamflow, and indices of the El Niño / Southern Oscillation are used in computerized statistical and simulation models to prepare runoff forecasts. Unless otherwise specified, all forecasts are for flows that would occur naturally without any upstream influences.

Forecasts of any kind, of course, are not perfect. Streamflow forecast uncertainty arises from three primary sources: (1) uncertain knowledge of future weather conditions, (2) uncertainty in the forecasting procedure, and (3) errors in the data. The forecast, therefore, must be interpreted not as a single value but rather as a range of values with specific probabilities of occurrence. The middle of the range is expressed by the 50% exceedance probability forecast, for which there is a 50% chance that the actual flow will be above, and a 50% chance that the actual flow will be below, this value. To describe the expected range around this 50% value, four other forecasts are provided, two smaller values (90% and 70% exceedance probability) and two larger values (30%, and 10% exceedance probability). For example, there is a 90% chance that the actual flow will be more than the 90% exceedance probability forecast. The others can be interpreted similarly.

The wider the spread among these values, the more uncertain the forecast. As the season progresses, forecasts become more accurate, primarily because a greater portion of the future weather conditions become known; this is reflected by a narrowing of the range around the 50% exceedance probability forecast. Users should take this uncertainty into consideration when making operational decisions by selecting forecasts corresponding to the level of risk they are willing to assume about the amount of water to be expected. If users anticipate receiving a lesser supply of water, or if they wish to increase their chances of having an adequate supply of water for their operations, they may want to base their decisions on the 90% or 70% exceedance probability forecasts, or something in between. On the other hand, if users are concerned about receiving too much water (for example, threat of flooding), they may want to base their decisions on the 30% or 10% exceedance probability forecasts, or something in between. Regardless of the forecast value users choose for operations, they should be prepared to deal with either more or less water. (Users should remember that even if the 90% exceedance probability forecast is used, there is still a 10% chance of receiving less than this amount.) By using the exceedance probability information, users can easily determine the chances of receiving more or less water.

Interpreting the Forecast Graphics

These graphics provide a new way to visualize the range of streamflows represented by the forecast exceedance probabilities for each forecast period. The colors in the bar for each forecast point indicate the exceedance probability of the forecasts and the vertical lines on the bar signify the five published forecast exceedance probabilities. The numbers displayed above the color scale represent the actual forecasted streamflow volume (in KAF) for the given exceedance probability. The horizontal axis provides the percent of median represented by each forecast and the gray line centered above 100% represents the 1981-2010 historical median streamflow. The position of the gray line relative to the color scale provides a benchmark for considering future streamflows. If the majority of the forecast range is to the right of the gray line, there is a higher likelihood of above median streamflow volumes during the provided forecast period. Conversely, if the majority of the color bar is to the left of the median mark, below median volumes are more likely. The horizontal span of the forecasts offers an indication of the uncertainty in a given forecast: when the bar spans a large horizontal range, the forecast skill is low and uncertainty is high; when the bar is narrow in width, the forecast skill is higher and uncertainty lower.





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In addition to the water supply outlook reports, water supply forecast information for the Western United States is available from the Natural Resources Conservation Service and the National Weather Service monthly, February through June. The information may be obtained from the Natural Resources Conservation Service web page at <http://www.wcc.nrcs.usda.gov/wsf/westwide.html>

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Clint Evans
State Conservationist
Natural Resources Conservation Service
Lakewood, Colorado

Colorado

Water Supply Outlook Report

Natural Resources Conservation Service
Lakewood, CO